WEST Search History

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DATE: Friday, August 05, 2005

Hide?	Set Name	Query	Hit Count
		DB=EPAB,JPAB,DWPI; PLUR=YES; OP=OR	
☐	L4	lee-e$.in. and (pharsight or confounder or influencer)	2

END OF SEARCH HISTORY

Set	Items	Description
S1	1706385	IDENTIF? OR LOCAT? OR NARROW?()DOWN? OR FIND? OR RETRIEV? OR TRACK? OR REVEAL?
S2	1017733	ASCERTAIN? OR DISCERN? OR SIFT? OR FILTER? OR RECOGN? OR DISTINGUISH? OR UNCOVER?
S3	809028	SINGL?()OUT OR PINPOINT? OR SORT??? OR INDICAT? OR DESIGNAT? OR TURN?()UP OR UNMASK?
S4	2435965	DETECT? OR DISCOVER? OR UNEARTH? OR EXPOSE? OR EXPOSING? OR CULL? OR FERRET?
S5	753611	S1:S4(7N)(METHOD? OR SYSTEM? OR PROCESS?? OR PROCEDUR? OR TECHNIQUE? OR MODE? ?)
S6	1962170	PATTERN? OR SIMILAR? OR LIKENESS? OR RELATIONSHIP? OR CONNECTION? OR CONCATENAT?
S7	2096839	KINSHIP? OR LINK? OR AFFILIAT? OR CORRESPOND? OR MATCH?
S8	191805	ASSOCIATION? OR CORRELAT? OR COINCIDEN? OR TREND? OR TRAJECTOR?
S9	648119	INFLUEN? OR IMPACT? OR SWAY? OR LEVERAG? OR BIAS? OR SLANT? OR PROPENSIT?
S10	25472	AFFECTATION? OR IMPING? OR CROSS()POLLEN? OR TAINT? OR SCREW?()UP
S11	532732	ERROR? OR FAULT? OR GLITCH? OR ADULTERAT? OR WARP? OR SPOIL?
S12	99666	SKEW? OR CONFOUND? OR MONKEY()WRENCH? OR PERTURB? OR MANIPULAT?
S13	1879	(UNFORESEEN? OR UNKNOWN? OR UNPREDICTAB? OR UNACCOUNT? OR UNEXPECT? OR UNANTICIPAT? OR OVERLOOK? OR INADVERTENT? OR SKIP? OR ELID? OR OMIT?)(3N)(FACTOR? OR ELEMENT? OR COMPONENT? OR DETERMINANT? OR VARIABL? OR CONSTITUENT?)
S14	1362169	OUTCOME? OR RESULT? OR CONCLUSION? OR ENDRESULT? OR EVENTUALIT?
S15	203866	DESTINAT? OR FINALE? OR COMPLETION? OR CESSATION? OR ENDING?
S16	44401	TERMINATION? OR AFTERMATH? OR UPSHOT? OR FALLOUT?
S17	652	REPERCUSSION? OR CULMINAT? OR RAMIFICAT?
S18	3856377	SET OR SETS OR GROUP? OR CLUSTER? OR ARRAY? OR ASSEMBL?
S19	2095489	PLURAL? OR SEVERAL? OR MULTIP? OR MULTIT?
S20	640661	COLLECTION? OR ASSORTMENT? OR NUMEROUS? OR SERIES? OR NODE?
S21	1358195	CONDITION? OR HYPOTHE? OR THEORET? OR PRETEND? OR SIMULAT?
S22	369850	ENVIRONMENT? OR SITUATION? OR CONTINGEN? OR QUALIFICATION?
S23	111386	STIPULATION? OR EVENT? OR CIRCUMSTAN? OR HAPPENING?
S24	361635	PHENOMEN? OR INCIDENT? OR OCCURRENC? OR EPISODE? OR SCENARIO?
S25	118673	MODEL? ? OR (TEST OR INSTANT OR REFERENCE OR IDEAL?)()(CASE? OR SET OR SETS)
S26	222079	QUERY? OR QUERIE? OR REQUEST? OR INTERROG?
S27	2036907	INQUIR? OR SEARCH? OR RETRIEV? OR INPUT? OR INTERFAC?
S28	11709	(STATIST? OR PROBABILIT? OR PREDICT?)(2N)(ANALY? OR DATA? OR THEOR? OR FORMULA?)
S29	1230653	IC=G06F?
S30	916228	MC=T01?
S31	23284	S1:S5 AND S6:S8 AND S9:S13 AND S14:S17
S32	3234	S31 AND S18:S20 AND S21:S25
S33	76	S32 AND S28
S34	935	S32 AND S29:S30
S35	499	S34 AND S26:S27
S36	174	S35 AND S18:S20(7N)S21:S25
S37	1101	S32 AND S6:S8(7N)(S14:S17 OR S21:S25)
S38	969	S31 AND S5(7N)S6:S8
S39	112	S36 AND S37:S38
S40	99	S37 AND S38
S41	256	S33 OR S39:S40

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S42    822712   PR=2002:2005
S43       217   S41 NOT S42
S44       217   IDPAT (sorted in duplicate/non-duplicate order)
File 347:JAPIO Nov 1976-2005/Apr(Updated 050801)
         (c) 2005 JPO & JAPIO
File 350:Derwent WPIX 1963-2005/UD,UM &UP=200550
         (c) 2005  Thomson Derwent
?
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S29	1230653	IC=G06F?
S30	916228	MC=T01?
S31	23284	S1:S5 AND S6:S8 AND S9:S13 AND S14:S17
S32	3234	S31 AND S18:S20 AND S21:S25
S33	76	S32 AND S28
S34	935	S32 AND S29:S30
S35	499	S34 AND S26:S27
S36	174	S35 AND S18:S20(7N)S21:S25
S37	1101	S32 AND S6:S8(7N)(S14:S17 OR S21:S25)
S38	969	S31 AND S5(7N)S6:S8
S39	112	S36 AND S37:S38
S40	99	S37 AND S38
S41	256	S33 OR S39:S40
S42	822712	PR=2002:2005
S43	217	S41 NOT S42
S44	217	IDPAT (sorted in duplicate/non-duplicate order)
S45	53	S34 AND (S5 AND S9:S17)/TI
S46	38	S45 NOT (S43 OR S42)
S47	38	IDPAT (sorted in duplicate/non-duplicate order)

SUPPLEMENTAL

STRATEGY

44/3,K/3 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX

011382762 **Image available**
WPI Acc No: 1997-360669/199733
XRPX Acc No: N97-299726
Fault **analysis appts for steel/chemical plants - has edit unit that processes displayed** search result **file data obtained by combining data file** detected **by** coincidence detection **unit with its previous and successive data files**
Patent Assignee: MITSUBISHI ELECTRIC CORP (MITQ)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 9152911	A	19970610	JP 95338053	A	19951130	199733	B

Priority Applications (No Type Date): JP 95338053 A 19951130
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 9152911	A		10		

Fault **analysis appts for steel/chemical plants**...

...**has edit unit that processes displayed** search result **file data obtained by combining data file** detected **by** coincidence detection **unit with its previous and successive data files**

...Abstract (Basic): The appts has a data **collection** unit (3) that collects data from a plant controller (1) within a fixed period, based on the output of a **collection** data setting unit (2). Based on output of data **collection** unit, a **collection** data file **group** (4) is created. A trigger **condition** setting unit (5) **designates fault** state in the plant according to trigger **conditions** .
...

...A trigger **condition coincidence detection** unit (6) **detects** the applicable data file from the data file **group** that agrees with the **set** trigger **conditions** . A display data generator (7) forms a **search result** file (8) by combining the data file **detected** by **coincidence detection** unit with its previous and successive data files. The **search result** file data is displayed in a CRT **indicator** (10). An edit unit (9) **processes** the displayed data...

...ADVANTAGE - Enables easy analysis of **fault** factor. Improves production efficiency. Enables to **identify** reason for generation of **fault** .
Title Terms: **FAULT** ;
International Patent Class (Additional): **G06F-003/14**
Manual Codes (EPI/S-X): **T01-J08F** ...

44/3,K/30 (Item 30 from file: 350)
DIALOG(R)File 350:Derwent WPIX

015893618
WPI Acc No: 2004-051453/200405
Related WPI Acc No: 2002-607461; 2004-096089; 2004-141585; 2004-237790
XRAM Acc No: C04-020834
XRPX Acc No: N04-041580

Identifying **statistically significant** group **of genomic data in the form of alleles and/or single nucleotide polymorphism** patterns , **by constructing neural network suitable to map genomic data, and exercising constructed neural network**

Patent Assignee: AROUH S (AROU-I); DIAMOND C (DIAM-I)
Inventor: AROUH S; DIAMOND C
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 20030204320	A1	20031030	US 99451249	A	19991129	200405 B
			US 2000611220	A	20000706	
			US 2003440713	A	20030519	

Priority Applications (No Type Date): US 2000611220 A 20000706; US 99451249 A 19991129; US 2003440713 A 20030519
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 20030204320	A1		43	G06F-017/60	CIP of application US 99451249 Div ex application US 2000611220

Identifying **statistically significant** group **of genomic data in the form of alleles and/or single nucleotide polymorphism** patterns , **by constructing neural network suitable to map genomic data, and exercising constructed neural network**

Abstract (Basic):
... A computerized **method** of **identifying** statistically significant **group** of at least two genomic data in the form of alleles and/or single nucleotide polymorphism (SNP) **patterns** includes constructing a neural network suitable to map the allele and/or SNP **pattern** genomic data, and exercising the constructed neural network to map the clinical alleles and/or SNP **pattern** genomic data, and conducting an automated procedure to vary the mapping function.
... A computerized **method** of **identifying** statistically significant **group** of at least two genomic data in the form of alleles and/or SNP **patterns** includes obtaining examples of clinical alleles and/or SNP **pattern** genomic data, and historical clinical **results corresponding** to this genomic data; constructing a neural network suitable to map the allele and/or SNP **pattern** genomic data as **inputs** to the neural network to the historical clinical **results** as outputs of the neural network; exercising the constructed neural network to map the clinical alleles and/or SNP **pattern** genomic data as **inputs** to the historical clinical **results** as outputs; and conducting an automated procedure to vary the mapping function, **inputs** to outputs, of the constructed and exercised neural network to realize a more optimal neural network mapping architecture by minimizing an **error** measure of the mapping function. Realization of the more optimal neural network mapping architecture shows that any irrelevant **inputs** are effectively excised, meaning that the more optimally mapping neural network will ignore **input** alleles and/or SNP **pattern** genomic data that is irrelevant to output clinical **results** . Realization of the more optimal neural network mapping architecture also shows that any

relevant **inputs** are effectively **identified** , making the more optimally mapping neural network to **identify** , and use those **input** alleles and/or SNP **pattern** genomic data that are relevant (in combination) to output clinical **results** .

...

...INDEPENDENT CLAIM is also included for a method of training a neural network having M **inputs** to extract information from genomic data having N variables, by organizing N genomic variables into M categories called artificial genes, where M is less than N; **inputting** the same **set** of N **input** values into each of these M categories as a functional block; creating a vector of...

...each of the M artificial genes using by the M artificial genes and the N **input** values, with the weights being initially **set** randomly; defining a dot (scalar) product of the N-valued vector with an **input** vector of N genomic variables to create one single output value; repeating the deriving of the dot product between successive **input** vectors each of a successive N genomic variables and the vector of N values that are initially random, for each of the M functional blocks to create a **filter** vector or artificial chromosome of M values which **correspond** to M genes in the artificial chromosome; mapping, with a neural network, the created **filter** vector or artificial chromosome as an **input** vector to calculate a cost output value a being a function of how **similar** the neural network output value is to a desired **result** , while also taking into consideration how many of the weights in the artificial genes are...

...values of the neural net to assume an optimal cost function, when fed as an **input** vector into the mapping neural net. The number of **inputs** to the mapping neural net is decreased to M out of the N genomic variables...

...preferentially discarded. The N genomic variables are divided into M categories or artificial chromosomes having **similar** functionality...

...The **method** is used to **identify** statistically significant **group** of at least two genomic data in the form of alleles and/or single nucleotide polymorphism (SNP) **patterns** . It can be used to predict optimal drug dosage and/or drug efficacy for a...

...The inventive **method** is effective and efficient in **identifying** statistically significant **group** of at least two genomic data in the form of alleles and/or single nucleotide polymorphism (SNP) **patterns** .

Technology Focus:

... of the neural network by a genetic mapping algorithm. The alleles data comprises a first **group** comprising entire gene families, specific alleles, specific base pair sequences, **locations** and types of introns, and nucleotide polymorphism; at least three members of a second **environmental** **group** comprising diet type, home region, occupation, viral levels, peptide levels, blood plasma levels, pharmacokinetic and pharmacodynamic parameters; and at least one member of a third **group** determined by combination of genetic and **environmental** factors comprising ethnicity and race. The genomic data affect clinical **results** data, e.g. presence of biological **conditions** , diseases, and characteristics; quantitative clinical measures of patient; presence of characteristics for which genetic or **environmental** origin is January 1, 2000 (either not clear or not

uniquely defined), including aggressive tendencies...

...which characteristics are called sociological variables; and cost or performance functions calculated from values of **multiple** real clinical variables.

Title Terms: **IDENTIFY** ;

International Patent Class (Main): **G06F-017/60**

...International Patent Class (Additional): **G06F-019/00**

...Manual Codes (EPI/S-X): **T01-J** ...

... **T01-N01A**

44/3,K/80 (Item 80 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013844504
WPI Acc No: 2001-328717/200134
Related WPI Acc No: 2000-038860; 2001-146758; 2001-557379; 2002-608475; 2003-076221; 2004-515398
XRAM Acc No: C01-100820
XRPX Acc No: N01-236565
Identification **of** patterns **in biological** systems **for diagnosing disease, e.g. colon cancer, includes training and testing learning machine using pre-processed training data** set **and pre-processed test data** set
Patent Assignee: BARNHILL TECHNOLOGIES LLC (BARN-N); BIOWULF TECHNOLOGIES LLC (BIOW-N)
Inventor: BARNHILL S D; GUYON I; WESTON J; BARNHILL S
Number of Countries: 095 Number of Patents: 006
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200131580	A2	20010503	WO 2000US29770	A	20001027	200134	B
AU 200112427	A	20010508	AU 200112427	A	20001027	200149	
EP 1236173	A2	20020904	EP 2000973988	A	20001027	200266	
			WO 2000US29770	A	20001027		
JP 2003529131	W	20030930	WO 2000US29770	A	20001027	200365	
			JP 2001534088	A	20001027		
US 6714925	B1	20040330	US 99303386	A	19990501	200423	
			US 99303387	A	19990501		
			US 99303389	A	19990501		
			US 99305345	A	19990501		
			US 99161806	P	19991027		
			US 99168703	P	19991202		
			US 2000184596	P	20000224		
			US 2000191219	P	20000322		
			US 2000568301	A	20000509		
			US 2000578011	A	20000524		
			US 2000633627	A	20000807		
AU 779635	B2	20050203	AU 200112427	A	20001027	200525	

Priority Applications (No Type Date): US 2000207026 P 20000525; US 99161806 P 19991027; US 99168703 P 19991202; US 2000184596 P 20000224; US 2000191219 P 20000322; US 2000568301 A 20000509; US 2000578011 A 20000524 ; US 99303386 A 19990501; US 99303387 A 19990501; US 99303389 A 19990501; US 99305345 A 19990501; US 2000633627 A 20000807
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200131580	A2	E	136	G06N-003/00	
Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW					
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TZ UG ZW					
AU 200112427	A				Based on patent WO 200131580
EP 1236173	A2	E		G06N-003/00	Based on patent WO 200131580
Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI					

JP 2003529131	W	162	G06N-001/00	Based on patent WO 200131580
US 6714925	B1		G06F-017/00	CIP of application US 99303386
				CIP of application US 99303387
				CIP of application US 99303389
				CIP of application US 99305345
				Provisional application US 99161806
				Provisional application US 99168703
				Provisional application US 2000184596
				Provisional application US 2000191219
				CIP of application US 2000568301
				CIP of application US 2000578011
				CIP of patent US 6128608
				CIP of patent US 6157921
				CIP of patent US 6658395
AU 779635	B2		G06N-003/00	Previous Publ. patent AU 200112427
				Based on patent WO 200131580

Identification **of** patterns **in biological** systems **for diagnosing disease, e.g. colon cancer, includes training and testing learning machine using pre-processed training data** set **and pre-processed test data** set

Abstract (Basic):

... **Patterns** in biological **systems** are **identified** by pre-processing a training data **set** from biological data, training a learning machine using the pre-processed training data **set** , pre-processing a test data **set** from biological data, testing the trained learning machine using the pre-processed test data **set** , and post-processing the test output to determine if the **identified pattern** is desirable.

... **Identification** of **patterns** in biological **systems** includes pre-processing a training data **set** derived from biological data to expand each training data point. A learning machine is trained using the pre-processed training data **set** . A test data **set** derived from biological data is pre-processed in the same manner with the training data **set** . The trained learning machine is tested using the pre-processed test data **set** . In response to receiving the test output of the trained learning machine, the test output is post- **processed** to determine if the knowledge **discovered** from the pre- **processed** test data **set** is desirable...

...2) a **method** for enhancing knowledge **discovered** from biological data using a support vector machine comprising...

...a) pre-processing a training data **set** derived from biological data to add meaning to each training data point...

...b) training the support vector machine using the pre-processed training data **set** ;
(...

...c) pre-processing a test data **set** derived from biological data in the same manner as was the training data **set** ;
(...

...d) testing the trained support vector machine using the pre-processed test data **set** ; and...

...3) a **system** for enhancing knowledge **discovered** from biological data, comprising...

...a) optionally, a server in communication with a distributed network for receiving a training data **set** , a test data **set** , a live data **set** and a financial account **identifier** from a remote source, the remote source also in communication with the distributed network...

...b) one or more storage devices for storing a training data **set** and a test data **set** ; and...

...4) a **method** for enhancing knowledge **discovery** using **multiple** support vector machines, comprising...

...a) pre-processing a training data **set** to add meaning to each of the training data points...

...b) training each support vector machine using the pre-processed training data **set** , each support vector machines comprising a different kernel ...

...c) pre-processing a test data in the same manner as was the training data **set** ;

(...

...5) a method for diagnosing disease using a learning machine or the **multiple** support vectors as described above...

...comprising administering agents to interfere with or enhance the activity of genes or genes products **identified** by one or more learning machines; and...

...7) a diagnostic device, comprising genetic probes that hybridize to genes **identified** as being associated with a disease by one or more learning machines; and...

...For **identifying** **patterns** in biological **systems** for diagnosing disease, e.g. colon cancer or breast cancer (claimed...

...The inventive method augments the training data to maximize the knowledge **discovery** by the learning machine and the value of the information delivered for human or further

Technology Focus:

... Preferred Method: The pre-processing of the training data **set** comprises adding dimensionality, preferably new coordinate(s) to each training data point. The new coordinates...

...or is computationally derived. It comprises optimally categorizing the continuous variable of the training data **set** . The post-processing of the test output comprises interpreting the test output into a format...

...point comprises a vector having one or more coordinates, where pre-processing the training data **set** to add meaning to each training data point comprises determining that the training data is...

...performance or historical data and is dependant on the nature of the knowledge to be **discovered** from the data or the nature of the data.

The method further comprises...

...b) collecting a live data **set** ;
(...

...c) pre-processing the live data- **set** in the same manner as was the training data **set** ;
(...

...d) **inputting** the pre-processed live data **set** to the support machine for processing; and...b) collecting a live biological data **set** ;
(...

...c) pre-processing the live biological data **set** in the same manner as was the training data **set** ;
(...

...e) **inputting** the pre-processed live data **set** into the selected trained support vector machine comprising the selected kernel; and...

...a) pre-processing a first training biological data **set** and a second training biological data **set** in order to add dimensionality to each of a **plurality** of training biological data points...

...one or more first support vector machines using the first pre-processed training biological data **set** , each of the first support vector machines comprising different kernels...training one or more second support vector machines using the second pre-processed training data **set** , each of the second support vector machines comprising different kernels...

...d) pre-processing a first test biological data **set** in the same manner as was the first training biological data **sets** and pre-processing a second test biological data **set** in the same manner as was the second training biological data **set** ;
(...

...of the first trained support vector machines using the first pre-processed test biological data **set** and testing each of the second trained support vector machines using the second pre-processed test biological data **set** ;
(...

...h) combining the first optimal solution with the second optimal solution to create a new **input** data **set** to be **input** into one or more additional support vector machines...

...other to determine which of the first test outputs represents a first lowest global minimum **error** ; and...

...other to determine which of the second test outputs represents a second lowest global minimum **error** .
...

...the disease is colon cancer or breast cancer. The knowledge derived from the test data **set** comprises genes associated with the diseasea) collecting the training data **set** from the database...

...b) pre-processing the training data **set** to add meaning to each of the training data points...

...c) training the support vector machine using the pre-processed training data **set** ;
(...

...d) in response to training the support vector machine, collecting the test data **set** from the database...

...e) pre-processing the test data in the same manner as was the training data **set** ;
(...

...f) testing the trained support vector machine using the pre-processed test data **set** ; and...

...The system further comprises a communications device for receiving the test data **set** and the training data **set** from a remote source, and a display device for displaying the post-processed test data...

...Preferred Device: The learning machine is a support vector machine, preferably a **multiple** support vector machine.

Extension Abstract:

... 96, pp. 6745-6750, Cell Biology, 1999. Gene expression information was extracted from microarray data **resulting** , after pre-processing, in a table of 62 tissues x 2000 genes. The 62 tissues ...

...with highest minimal intensity across the 62 tissues. One problem in the colon cancer data **set** was that tumor samples and normal samples differed in cell composition. Tumor samples were normally...

...easily separated on the basis of cell composition, this separation was not very informative for **tracking** cancer-related genes...

...6745-6750, Cell Biology, 1999 provides an analysis of the data based on top down **clustering** , a method of unsupervised learning and also **clusters** genes by showing that some genes **correlate** with a cancer vs normal separation scheme but do not suggest a specific method of...

...method like that used in Golub et al., Science,1999. In Golub, the authors use **several** metrics of classifier quality, including **error** rate, rejection rate at fixed threshold, and classification confidence. Each value is computed both on the independent **test set** and using the leave-one-out method on the...

...training **set** . The leave-one-out method consists of removing one example from the training **set** , constructing the decision function on the basis only of the remaining training data and then...

...this method, one tests all examples of the training data and measures the fraction of **error** over the total number of training examples...

...according to the sign of the SVM (undefined) output. The magnitude of the output is **indicative** of classification confidence. Four metrics of classifier quality were used, i.e. **Error** (B 1 +B2) number of **errors** (bad) at zero rejection, Reject (RI+R2) minimum number of rejected samples to obtain zero **error** , Extremal margin (E/D)=difference between the smallest output of the positive class

samples and...

...Each value is computed both on the training **set** with the leave-one-out method...

...and on the **test set** . The **error** rate is the fraction of examples that are misclassified (**corresponding** to a diagnostic **error**). It is complemented by the success rate. The rejection rate is the fraction of examples...

... **test set** differed from the margin computed on training examples sometimes used in...

... **model** selection criteria.

Title Terms: **IDENTIFY** ;

International Patent Class (Main): **G06F-017/00** ...

Manual Codes (EPI/S-X): **T01-E05D**

44/3,K/83 (Item 83 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013598640 **Image available**
WPI Acc No: 2001-082847/200110
XRPX Acc No: N01-063278

Fault **diagnosis** method **for diagnosing probable cause of** detected faults **in complex** system **such as nuclear plant using probablistic reasoning utilizes Bayesien network in which probabilities are generated automatically**

Patent Assignee: SIEMENS CORP RES INC (SIEI)
Inventor: DARKEN C; ERDMANN J; SANTOSO N I
Number of Countries: 027 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
EP 1065578	A1	20010103	EP 2000109869	A	20000510	200110 B
JP 2000356696	A	20001226	JP 2000142431	A	20000515	200116
US 6785636	B1	20040831	US 99134159	P	19990514	200457
			US 2000522884	A	20000310	

Priority Applications (No Type Date): US 2000522884 A 20000310; US 99134159 P 19990514
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 1065578	A1	E	16	G05B-023/02	
	Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI				
JP 2000356696	A		9	G21C-017/00	
US 6785636	B1			G06F-017/00	Provisional application US 99134159

Fault **diagnosis** method **for diagnosing probable cause of** detected faults **in complex** system **such as nuclear plant using probablistic reasoning utilizes Bayesien network in which probabilities are generated** ...

Abstract (Basic):

... system involves providing a causal network which is trained to provide a diagnosis based on **input** of extracted features from real time measurement values taken from the complex system, and providing a graphical user **interface** which is responsive to **input** of the extracted features for presenting to an operator responsible for making a diagnoses of the complex system, simultaneous **multiple hypotheses** as to the current **condition** of the complex system.

... An INDEPENDENT CLAIM is included for an apparatus for assisting in diagnosing **faults** in a complex system...

...For diagnosing probable cause of **detected faults** in complex **system** such as nuclear plant...

...Supports a comprehensible explanation of the **results** as well as a strong **correspondence** to probablistic **relationships** between causes and effects...

Title Terms: **FAULT** ;
...International Patent Class (Main): **G06F-017/00**
Manual Codes (EPI/S-X): **T01-G08** ...

... T01-J16C

44/3,K/112 (Item 112 from file: 350)
DIALOG(R)File 350:Derwent WPIX

011680456 **Image available**
WPI Acc No: 1998-097365/199809
XRPX Acc No: N98-078265
Discovery method **for** pattern **used in e.g. apparatus** fault **diagnosis, demand forecast - by evaluating** simulation result , **in which** pattern **candidate that** corresponds **to parameter candidate is used, of problem solving reasoning to select and decide parameter**
Patent Assignee: TOSHIBA KK (TOKE)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 9325890	A	19971216	JP 96141729	A	19960604	199809	B

Priority Applications (No Type Date): JP 96141729 A 19960604
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 9325890	A		8	G06F-009/44	

Discovery method **for** pattern **used in e.g. apparatus** fault **diagnosis, demand forecast...**
...**by evaluating** simulation result , **in which** pattern **candidate that** corresponds **to parameter candidate is used, of problem solving reasoning to select and decide parameter**

...Abstract (Basic): The method involves forming the parameter candidate of a **cluster** division. A **pattern** candidate which **corresponds** to the parameter candidate is formed and used to **simulate** a problem solving reasoning. The **simulation result** is evaluated. Using the evaluation **result** , the parameter is selected and decided...

...USE - For e.g. sales **prediction** , preventive maintenance, **data** monitor...

...ADVANTAGE - Offers suitable data **pattern discovery** function. Reduces parameter adjustment work of **system** developer...
Title Terms: **DISCOVER** ;

44/3,K/114 (Item 114 from file: 350)
DIALOG(R)File 350:Derwent WPIX

011468519 **Image available**
WPI Acc No: 1997-446426/199741
XRPX Acc No: N97-372047
Fault **diagnosis appts of network system - has judging device to judge** connection **of estimated cause which** results **in abnormality**
Patent Assignee: TOSHIBA KK (TOKE)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 9205429	A	19970805	JP 9613033	A	19960129	199741	B

Priority Applications (No Type Date): JP 9613033 A 19960129
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 9205429	A		13	H04L-012/24	

Fault **diagnosis appts of network system...**

...**has judging device to judge** connection **of estimated cause which** results **in abnormality**
...Abstract (Basic): The appts consists of a data transmission path which connects a number of **nodes** . The data is transmitted from a transmission frame (1). A data formation device (2) produces system data based on information obtained from the transmission frame. An abnormality **detector** (4) judges whether the **system** data **corresponds** to any abnormal **phenomena** established earlier...

...The data when **corresponds** to abnormal **phenomena** , a cause estimation device selects the estimated cause of the abnormality. A **simulator** that stimulates the network to operate in abnormal **conditions** due to the selected estimated cause. The **result** of stimulation study is compared with that the system data. A judging device thus judges the **connection** required for the estimated abnormality cause...
Title Terms: **FAULT** ;

44/3,K/129 (Item 129 from file: 350)
DIALOG(R)File 350:Derwent WPIX

010542829 **Image available**
WPI Acc No: 1996-039783/199604
XRPX Acc No: N96-033542
Identifying **frequently occurring fabrication defects automatically, for integrated circuit design - generating response matrix from electrical responses to input** patterns **as function of fabrication defects, and generating statistical failure information from responses to test vectors using response matrix**
Patent Assignee: SEMICONDUCTOR DIAGNOSIS & TEST CORP (SEMI-N)
Inventor: CAYWOOD J M; HELFFRICH A B; LEPEJIAN Y D
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5475695	A	19951212	US 9333775	A	19930319	199604	B

Priority Applications (No Type Date): US 9333775 A 19930319
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5475695	A		7	G01R-031/28	

Identifying **frequently occurring fabrication defects automatically, for integrated circuit design...**

...**generating response matrix from electrical responses to input** patterns **as function of fabrication defects, and generating statistical failure information from responses to test vectors...**

...Abstract (Basic): An automated **identification** of fabrication defects involves analysing design information of the IC to **identify** electrical **node** -to- **node faults** . The electrical response to input **patterns** which **result** from these **faults** is determined, and a matrix which relates failure responses to a **multiplicity** of input **patterns** as a function of **process** defects is constructed, which is used to **identify** the fabrication defect. In those cases in which the response matrix is degenerate, i.e. a **set** of output responses can arise from more than one **fault** , knowledge about the probability of **occurrence** of various defects is used to assign probabilities to the **node** -to- **node faults** which may generate the output response **set** .
...

...takes knowledge of a specific IC test system and the response matrix to generate a **set** of test vectors to analyze a product. The system instructs the IC test system to apply these vectors to the device under test, the response of which is used to **identify** the fabrication defect which caused the device to fail. **Results** from statistical measures of many test **results** enables predominant manufacturing defect to be **identified** .
...
...ADVANTAGE - Automatic **fault detection** enables faster **identification** of predominant defect type enabling meaningful **statistical analysis** , thus helping to **identify** most important manufacturing problem to be solved, to improve yield
Title Terms: **IDENTIFY** ;

44/3,K/161 (Item 161 from file: 350)
DIALOG(R)File 350:Derwent WPIX

004750097
WPI Acc No: 1986-253438/198639
XRPX Acc No: N86-189534
Automatic trouble analysis apparatus - creates fuzzy membership functions and hypothetical **propositions to infer causes of accidents**
Patent Assignee: TOSHIBA KK (TOKE)
Inventor: MATSUMOTO Y
Number of Countries: 008 Number of Patents: 006
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 195449	A	19860924	EP 86103801	A	19860320	198639	B
JP 61218323	A	19860927	JP 8556527	A	19850320	198645	
AU 8654859	A	19860925				198646	
US 4839823	A	19890613	US 88230723	A	19880810	198930	
EP 195449	B	19910130	EP 86103801	A	19860320	199105	
DE 3677240	G	19910307				199111	

Priority Applications (No Type Date): JP 8556527 A 19850320
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 195449	A	E	37		
Designated States (Regional): CH DE FR GB LI					
EP 195449	B				
Designated States (Regional): CH DE FR GB LI					

... **creates fuzzy membership functions and** hypothetical **propositions to infer causes of accidents**

...Abstract (Basic): The cause of an accident and a **series** of effects **corresponding** to the cause are entered via keyboard (9) and stored as a data base in...

...disc unit (5). The sum of basic probabilities of the effects for the cause is **set** to be unity. A pre-processor (3) calculates and uses the upper or lower probability of a subset of the **result** to create Fuzzy membership functions and also creates a **hypothetical** proposition for **corresponding** the Fuzzy membership function and the cause. An inference engine **matches** accident **phenomena** with the effects and infers the cause using the **hypothetical** proposition...

...USE - Use of trouble analysis method combining Dempster and Shefer **probability theory** with Fuzzy theory e.g. applied to power transmission network. (37pp Dwg.No.4/10)
...Abstract (Equivalent): first input means (1) for receiving obsev vation information on a system consisting of a **plurality** of-elements subjected to monitoring and facilities assigned to various operational facility types, and for receiving **fault** information when an accident occurs; storage means (5) for storing the observation information on said elements and facilities as a data base; second input means (9) for receiving a **plurality** of effects for one cause as cause/effect **relationships** and a basic propababilty with a sum of 1; and a computer (51) connected to...

...said storage means (5), creates a first list of elements in the system operated in **association** with an accident, if said accident occurs, **retrieves** the data base in said storage means (5) in accordance with the first list, creates a second list of facility names assumed to be associated with the accident, determines a **correspondence** between each facility in the second list and the operational facility type, creates a third list representing a **correspondence** between a logical name of the real facility and a logical name of the operational...

...Abstract (Equivalent): cause of an accident which is empirically and statistically obtained and a number of effects **corresponding** to the cause are entered in advance at a keyboard and stored as a data...

...as upper (or lower) probability of a subset of the **result**0 by using the Dempster and Shafter **probability theory** .

...

...uses the upper or lower probability to creat Fuzzy membership functions and also creates a **hypothetical** proposition for **corresponding** the Fuzzy membership function and the cause. An inference engine **matches** accident **phenomena** with the effects when an accident occurs and infers the cause by a modified Fuzzy inference method using the **hypothetical** proposition

...Title Terms: **HYPOTHESIS** ;

44/3,K/214 (Item 214 from file: 347)

01218017 **Image available**
ABNORMAL STATE **DETECTING** DEVICE OF **PROCESS**

PUB. NO.: 58-155417 [JP 58155417 A]
PUBLISHED: September 16, 1983 (19830916)
INVENTOR(s): MORIMOTO HARUKI
FUJIWARA TOSHIKATSU
APPLICANT(s): MITSUBISHI HEAVY IND LTD [000620] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 57-039024 [JP 8239024]
FILED: March 12, 1982 (19820312)
JOURNAL: Section: P, Section No. 242, Vol. 07, No. 278, Pg. 90, December 10, 1983 (19831210)

ABNORMAL STATE **DETECTING** DEVICE OF **PROCESS**

ABSTRACT
... titled device have redundancy for deciding an abnormal state, and to improve the reliability for **detection** , by comparing an output of each **detector** with an output of a **corresponding** **model** apparatus, and discriminating an abnormal control apparatus by a majority circuit...
... apparatuses take a value shifted from a normal value, respectively, but since a dynamic characteristic **model** used for an abnormal state of the process uses only a **set** value as an input brought from the process, the same value that is same as the **set** value applied to a setting device 3 is inputted to a **set** **model** 13. In this way, a **result** of dynamic characteristic calculation is not **influenced** by an abnormal state of the apparatus for constituting the process. Accordingly, in case when a difference between a measured value X(sub i) and a calculation **result** Y(sub i) exceed a threshold level by M-number or more, among the whole...

... device is made to have redundancy for deciding an abnormal state, and the reliability of **detection** can be improved.

47/3,K/33 (Item 33 from file: 350)
DIALOG(R)File 350:Derwent WPIX

004552266
WPI Acc No: 1986-055610/198608
XRPX Acc No: N86-040707
Identifying faulty **units in computer controlled** system **- by aging history list of** fault **weights and then combining it with initial list to provide new history list**
Patent Assignee: AMERICAN TELEPHONE & TELEGRAPH CO (AMTT)
Inventor: ABEL M J; KWAN C L; POLLI P V; VEACH M T
Number of Countries: 014 Number of Patents: 007
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 8601019	A	19860213				198608	B
EP 190216	A	19860813				198633	
JP 61502847	W	19861204				198703	
US 4633467	A	19861230				198703	
CA 1227875	A	19871006				198744	
EP 190216	B	19911204				199149	
DE 3584835	G	19920116				199204	

Priority Applications (No Type Date): US 84634461 A 19840726
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 8601019	A	E	21		
Designated States (National): JP					
Designated States (Regional): AT BE CH DE FR GB IT LU NL SE					
EP 190216	A	E			
Designated States (Regional): AT BE CH DE FR GB LI LU NL SE					
EP 190216	B				
Designated States (Regional): BE DE FR GB IT NL SE					

Identifying faulty **units in computer controlled** system - ...

...**by aging history list of** fault **weights and then combining it with initial list to provide new history list**

...Abstract (Basic): unit and at least one interface unit, prescribed ones of the units generating and returning **error** report messages to the CPU in response to **detection** of prescribed **error conditions** . In response to receipt of an **error** report, a predefined **error condition** and one of the units generating the **error** report are **identified** and an initial list of predetermined **fault** probability weights for the units is generated. A history list containing **fault** weights generated by the next-mentioned step is aged as a **result** of receipt of a last **error** report by reducing the **fault** weights for each unit in the history list according to an algorithm based on elapsed time since receipt of the last **error** report. A new history list is generated by individually combining the **fault** weights in the aged history list for each unit according to a second algorithm. That unit having the largest **fault** weight in the new history list that also has a non-zero **fault** weight in the initial list, is then selected as a **faulty** unit.
...Abstract (Equivalent): A **method** for controlling a processing unit to **identify** a **faulty system** unit in a computer **system** comprising

said processing unit (CPU), a peripheral unit (SM), and at least one interface unit...

...SM) and in which prescribed ones of the units including means for generating and returning **error** report messages to the processing units (CPU) in response to the **detection** of prescribed **error conditions** , said **method** comprising the steps of - in response to receipt of an **error** report message **identifying** a predefined **error** type, -deriving (204) an initial list of predetermined **fault** probability weights from an entry in a **fault** weight table **corresponding** to the **error** type, the initial list being obtained by associating a first specific **fault** probability weight with each unit of a first **set** of at least a predetermined one of the units, - maintaining a history list of **fault** weights, the history list being initially obtained by associating a second specific **fault** probability weight with each unit of a second **set** of predetermined units, using the initial list to update the history list, the update including combining the said first **fault** weights list with the said second **fault** weights list according to a first prescribed algorithm for each unit which belongs to both the initial list and history list, and - selecting (310) as a **faulty** unit that unit having the largest **fault** weight in the updated history list, and CHARACTERISED BY aging (206) the history list before generating the updated history list by reducing the **fault** weights for each unit in the history list according to a second prescribed algorithm based on elapsed time since receipt of the last **error** report message. (15pp)

...Abstract (Equivalent): In response to receipt of an **error** report, a predefined **error condition** and one of tpe prescribed units generating the **error** report are **identified** for generating an initial list of predetermined **fault** probability weights for the system units. A history list containing **fault** weights generated by the next-mentioned step as a **result** of receipt of a last **error** report by reducing the **fault** weights is aged for each unit in the history list according to a first prescribed algorithm based on elapsed time since receipt of the last **error** report...

...A new history list is generated by individually combining the **fault** weights in the initial list with the **fault** weights in the aged history list for each unit according to a second prescribed algorithm. A unit is selected, as a **faulty** unit, having the largest **fault** weight in the new history list that also has a non-zero **fault** weight in the initial list. (11pp)

Title Terms: **IDENTIFY** ;
International Patent Class (Additional): **G06F-011/20**
Manual Codes (EPI/S-X): **T01-G02** ...

... **T01-G03**

Set	Items	Description
S1	1216294	IDENTIF? OR LOCAT? OR NARROW?()DOWN? OR FIND? OR RETRIEV? OR TRACK? OR REVEAL?
S2	721092	ASCERTAIN? OR DISCERN? OR SIFT? OR FILTER? OR RECOGN? OR DISTINGUISH? OR UNCOVER?
S3	1550943	SINGL?()OUT OR PINPOINT? OR SORT??? OR INDICAT? OR DESIGNAT? OR TURN?()UP OR UNMASK? OR BACKPROPAGAT?
S4	1270805	DETECT? OR DISCOVER? OR UNEARTH? OR EXPOSE? OR EXPOSING? OR CULL? OR FERRET? OR DETERMIN?
S5	782235	S1:S4(7N)(METHOD? OR SYSTEM? OR PROCESS?? OR PROCEDUR? OR TECHNIQUE? OR MODE? ?)
S6	1264515	PATTERN? OR SIMILAR? OR LIKENESS? OR RELATIONSHIP? OR CONNECTION? OR CONCATENAT?
S7	1301149	KINSHIP? OR LINK? OR AFFILIAT? OR CORRESPOND? OR MATCH?
S8	419372	ASSOCIATION? OR CORRELAT? OR COINCIDEN? OR TREND? OR TRAJECTOR? OR COINCID?
S9	538696	INFLUEN? OR IMPACT? OR SWAY? OR LEVERAG? OR BIAS? OR SLANT? OR PROPENSIT?
S10	51070	AFFECTATION? OR IMPING? OR CROSS()POLLEN? OR TAINT? OR SCREW?()UP
S11	297115	ERROR? OR FAULT? OR GLITCH? OR ADULTERAT? OR WARP? OR SPOIL? OR BLEEDTHRU? OR BLEEDTHROUGH? OR BLEED?()(THRU OR THROUGH?)
S12	234414	SKEW? OR CONFOUND? OR MONKEY()WRENCH? OR PERTURB? OR MANIPULAT?
S13	18225	(UNFORESEEN? OR UNKNOWN? OR UNPREDICTAB? OR UNACCOUNT? OR UNEXPECT? OR UNANTICIPAT? OR OVERLOOK? OR INADVERTENT? OR SKIP? OR ELID? OR OMIT?)(3N)(FACTOR? OR ELEMENT? OR COMPONENT? OR DETERMINANT? OR VARIABL? OR CONSTITUENT? OR COEFFICIENT?)
S14	1339090	OUTCOME? OR RESULT? OR CONCLUSION? OR ENDRESULT? OR EVENTUALIT? OR CAUSE?(2W)EFFECT?
S15	321195	DESTINAT? OR FINALE? OR COMPLETION? OR CESSATION? OR ENDING? OR PROXIMAT?()CAUSE?
S16	85753	TERMINATION? OR AFTERMATH? OR UPSHOT? OR FALLOUT?
S17	24466	REPERCUSSION? OR CULMINAT? OR RAMIFICAT? OR HISTOGRA?
S18	1446666	SET OR SETS OR GROUP? OR CLUSTER? OR ARRAY? OR ASSEMBL?
S19	1213709	PLURAL? OR SEVERAL? OR MULTIP? OR MULTIT?
S20	680161	COLLECTION? OR ASSORTMENT? OR NUMEROUS? OR SERIES? OR NODE?
S21	990069	CONDITION? OR HYPOTHE? OR THEORET? OR PRETEND? OR SIMULAT?
S22	577086	ENVIRONMENT? OR SITUATION? OR CONTINGEN? OR QUALIFICATION?
S23	690761	STIPULATION? OR EVENT? OR CIRCUMSTAN? OR HAPPENING?
S24	359916	PHENOMEN? OR INCIDENT? OR OCCURRENC? OR EPISODE? OR SCENARIO?
S25	291776	MODEL? ? OR (TEST OR INSTANT OR REFERENCE OR IDEAL?)()(CASE? OR SET OR SETS)
S26	42417	(STATIST? OR PROBABILIT? OR PREDICT?)(2N)(ANALY? OR DATA? OR THEOR? OR FORMULA?)
S27	148842	IC=G06F?
S28	10596	S5(5N)S6:S8(5N)S9:S13
S29	8550	S28 AND S6:S13(5N)(S14:S17 OR S21:S25)
S30	1522	S29 AND S26
S31	362	S30 AND S27
S32	1681	S29 AND S27
S33	2841	S30:S32
S34	1689	S33 AND S18:S20(5N)S21:S25
S35	1907	S33 AND S6:S13(5N)S14:S17 AND S6:S13(5N)S21:S25
S36	1287	S34 AND S35
S37	239	S31 AND S36
S38	718	S30 AND S21:S25(7N)(QUERY? OR QUERIE? OR REQUEST? OR INTERROG? OR INQUIR? OR SEARCH? OR RETRIEV? OR INPUT? OR INTERFAC?)
S39	908	S30 AND S14:S17(5N)S21:S25

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S40         699   S38:S39 AND S36
S41         699   S40 AND S26
S42         220   S41 AND S27
S43         220   S37 AND S42
S44      768832   AD=2002:2005
S45         141   S43 NOT S44
S46         239   S37 OR S42
S47         150   S46 NOT S44
S48         150   S45 OR S47
S49         150   IDPAT (sorted in duplicate/non-duplicate order)
S50        1522   S30:S31
S51         179   S50 AND S5/TI
S52         167   S51 NOT S48
S53         105   S52 NOT S44
S54         105   IDPAT (sorted in duplicate/non-duplicate order)
S55         312   S33 AND S5/TI
S56         251   S55 AND (S34:S36 OR S38)
S57         156   S56 NOT (S44 OR S48)
S58         156   IDPAT (sorted in duplicate/non-duplicate order)
S59         169   S54 OR S58
File 348:EUROPEAN PATENTS 1978-2005/Jul W05
         (c) 2005 European Patent Office
File 349:PCT FULLTEXT 1979-2005/UB=20050804,UT=20050728
         (c) 2005 WIPO/Univentio
?
```

49/3,K/47 (Item 47 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00888082
PROCESS FOR ESTIMATING RANDOM ERROR IN CHEMICAL AND BIOLOGICAL ASSAYS
PROCEDE DESTINE A L'EVALUATION D'ERREURS ALEATOIRES DANS DES DOSAGES CHIMIQUES ET BIOLOGIQUES
Patent Applicant/Assignee:
IMAGING RESEARCH INC, Brock University, 500 Glenridge Avenue, St. Catharines, Ontario L2S 3A1, CA, CA (Residence), CA (Nationality), (For all designated states except: US)
Patent Applicant/Inventor:
SUSKO Edward, 80 Camelot Lane, Apt. 126, Halifax, Nova Scotia B3M 4KB, CA , CA (Residence), CA (Nationality), (Designated only for: US)
NADON Robert, 35 South Drive, St Catharines, Ontario L2R 4T9, CA, CA (Residence), CA (Nationality), (Designated only for: US)
Patent and Priority Information (Country, Number, Date):
Patent: WO 200220824 A2-A3 20020314 (WO 0220824)
Application: WO 2001IB1625 20010907 (PCT/WO IB0101625)
Priority Application: US 2000231074 20000908
Designated States:
(Protection type is "patent" unless otherwise stated - for applications prior to 2004)
AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM EC EE ES FI GB GD GE GH HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PH PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 6189

Main International Patent Class: **G06F-019/00**
Fulltext Availability:
Detailed Description

Detailed Description
... outlier" will refer to an extreme value in a distribution of values. Outlier data often **result** from uncorrectable measurement **errors** and are typically deleted from further **statistical analysis** .

There are two kinds of error, random and systematic, which affect the extent to which...
...values of the same process or attribute. The extent and the distributional form of random **errors** can be detected by repeated measurements of the same process or attribute. Low random **error corresponds** to high precision. Systematic **errors** produce shifts 1 0 (offsets) in measured values. Measured values with systematic **errors** are said to be "biased".

Systematic errors cannot be detected by repeated measurements of the same process or attribute because the **bias** affects the repeated measurements equally. Low systematic **error corresponds** to high accuracy. The terms "systematic **error** ", " **bias** ", and "offset" will be used inter-changeably in the present document.

1 5 An invention...

...in the distribution), it is called an outlier. An outlier is typically removed from further **statistical analysis** because it generally indicates that the measured value contains excessive measurement error that cannot be...

...analytical mathematical approach that estimates the distribution of non-replicated differential ratios under the null **hypothesis** . This approach is **similar** to the present invention in that it derives a method for obtaining confidence intervals and...distributed around a ratio of approximately 1). The method, as derived, cannot accommodate other measurement **error models** (e.g., lognormal). It also assumes that all measured values are unbiased and reliable estimates...

...embodiment, with reference being had to the accompanying drawings, in which.

Figure 1 shows the **results** of residual estimation based on **simulated** data; and 0 Figures 2 and 3 shows results of residual estimation based on actual...

...is small, for instance 2 or 3.

Assumptions such as these arise naturally in measurement **error models** .. While our interest in estimating the residual distribution arose in the analysis of gene expression...

...radio-isotopic, fluorescent, fluorescent ratios) can be labeled y.ij where g denotes the experimental **condition** that the observed values **correspond** to (for instance, drug versus control, different tissues, etc.).

The index i indicates the genetic...

...Y21 + Za/2 /777+ (T 2 / M
YU 2
Here a 2 is the measurement **error** variance for the gth **condition** .
With known non-normal
9 I
residual distributions different forms of confidence intervals would usually...

...that of -Fij or 6ij.
Thusskevvmessintheresidualdistributionwillnotberecoverablefromthedistribution ofthe difference of two errors. A common assumption for measurement **error models** is that the residual distribution is symmetric.
Recognizing that we cannot detect skewness we will...CT2/M
Yli. - Y2i- +/- 1.96V9 1 2
Shnulation Results
To further evaluate the methodologies **several simulations** were considered. For' each **set** of **simulations** , samples from (1) were generated from a given residual distribution with n = 5 00 and...
...were drawn. For (iii) the first I 000 samples were used. A summary of the **results** of the **simulations** are given in Tables 1 The estimates of the probabilities from (ii) are biased downwards...

...a large number of observations are required for consistent estimation of the density function, the **simulation results** indicate that reasonable estimates ofthe cumulative distribution probability estimates can be

obtained with n > 5 00, which is usually the situation for gene expression data..

The **simulation results** further favor less smoothing than one might expect. The pseudo-likelihood density estimates give reasonable...are also described as "an extreme value in a distribution of values." Outlier data often **result** from uncorrectable measurement **errors** and are typically deleted from further **statistical analysis** ." Point 2, above, also refers to detecting an extreme value but in that case the...

49/3,K/55 (Item 55 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00855152 **Image available**
METHOD AND SYSTEM FOR DATA CLASSIFICATION IN THE PRESENCE OF A TEMPORAL NON-STATIONARITY
PROCEDE ET SYSTEME DE CLASSEMENT DE DONNEES EN PRESENCE D'UNE NON STATIONNARITE TEMPORELLE
Patent Applicant/Assignee:
NEW YORK UNIVERSITY, 70 Washington Square South, New York, NY 10012-1091, US, US (Residence), US (Nationality), (For all designated states except: US)
Patent Applicant/Inventor:
BERGER Gideon, Apartment 4G, 50 East 89th Street, New York, NY 10128, US, US (Residence), US (Nationality), (Designated only for: US)
MISHRA Bhubaneswar, 16 Dunster Road, Great Neck, NY 11021, US, US (Residence), IN (Nationality), (Designated only for: US)
Legal Representative:
CLARK Richard S (et al) (agent), Baker Botts LLP, 30 Rockefeller Plaza, New York, NY 10112-0228, US,
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Detailed Description
Claims

Detailed Description
... independent predictor variables have been developed by lo practitioners in the al t of the **statistical analysis** and **data** mining for a number of years. Also, a number of conventional approaches for modeling data...

...such data has been widely used or accepted by those in the art of the **statistical analysis** . For a better understanding of the difficulties with the prior art appiroaches, temporal data and...

...training data to out-of-sample test data cither because of inherent changes in this **relationship** over time, or because of some external **impact** . For example, with a conventional network intrusion **detection** systein, a predictive **model** of maliclous network activity can be constructed based on, e.g., TCP/IP log files...the input sequences can be

scanned to determine an interestingness measure of at least one **event** in the **input** sequences. It is also possible to initializc a pattem list by inserting all **events** of the **input** sequences therein. Then, from all pattems in the pattem list, a first pattem which has...

...cmbodiment of the present invcntion, a patteni list lo may be initialized by inserting all. **events** of the **input** sequences therein, and at least one suffix list can also be initialized. Locations of certain...

...records. A plurality of sets of the farther records are also generated, and. the prediction **model** is generated for each **set** of the nirther records.

Furthermore, a single model can be generated based on cach fimetional **model** of the 2o respective **set** of the flulher records.

According to yet another embodiment of the present invention, the data... inverted exclamation mark)t is the measure of how much the oecurrence of the pattem **correlates** with the **occurrence** of a single value of the predicted variable. The detennination of the interestingness measure can ...the training data (e.g., which used the in-sample data for generating the prediction **model**). lf the current pattem **corresponds** to the pattems in set SI, then the pattem is assigned as being of the...

...in step 250) whether the current pattem corresponds to the second type of an expected **event** that is provided in **set** S2.

lf the current pattem corresponds to the pattems in set S2, then the pattern...

...above with reference to steps 240, 260, 270, the determination regarding the type of the **event** (of the current **pattern**) is output in step 280.

Given that the data records are populated with both. a...of occurrences exceeds a certain threshold. This exemplary tecImique is illustrated in Figure 4A. First, **input** string(s)/sequence(s) 305, **event** probabilities 306, a threshold T for the interestingness measure 307 and a number for a...

...is also a pattern, "Op" ranges over the temporal operators, and X ranges over all.

events . Thereafter, the interestingness or unexpected **pattern** (s) of all newly discovered pattems C' is deterinined, Le., by the system 1 0...

...to first find all. pattems that occur relatively frequently, given a class of operators, an **input** sequence of **events** , and a frequeney throshold.

The excinplary technique for solving this problem has two altemating phases...

...two pattems with operator Op to create a
larger pattem and determino the number of **occurrences** of the **resulting**

pattem, it is preferable to detennine the number and locations of Op's two operands...This feature of the interestingness measure can be understood using the following example.

Let the **set** of **events** be E = { A, B, C}. Assume that the probability

of these events is Pr[A...

...of oceurrences of the pattem should preferably exceed 2. For example, the following string of **events** can be **input** into the system 1 0.

ABABABABCCCCCCCCCCCC (the length of this string being N = 20)
Given...

...have oceurred fewer times than the frequeney threshold, it may be discarded as adding new **events** to it, and ---thus cannot **result** in a frequent pattem (which is not the case using the interestingness measure). The addition of an **event** to an uninteresting pattem can **result** in the discovery of an interesting pattem being created. This inability to prune the discovered...
...there any uninteresting pattems worth expanding.

Aceording to this exemplary embodiment of the present invention, **input** string(s)/sequence(s) 355, **event** probabilities 356, a threshold T for the interestingness measure 357, a number for a maximum...In all classification techniques, the introduction of additional degrees of freedom reduces the in sample **error** (**bias**) of the **model** while increasing the **model** variance. This frequently **results** in poor approximations of out of sample data. To address this problem, some classification methods include a techuique for reducing the **model** **bias** , typlcally via a reduction in the classification modeFs degrees of freedom. This reduction in degrees of freedom increases **bias** in the classification **model** , wlule reducing its variance aud out-of-sqmple error.

The combination of thc forecasts can...

...March 1973, pp. 1 17-13 0, was originally developed for the case of reducing **bias** in linear functions. The **results** of the Stein's estimator can be extended for the nonfinear case. For example, by...
second stage of the teclinique - elassification, Le., ~S.
~S generates a functional model of the **data** capable of **predicting** intrusions on lo out-oPsample data based on the current data records (step 530). Then...

...records, and the process retums to step 530 so that a number of fimetio:nal **models** are generated. This **set** of **models** is then **input** into the final stage of the teclinique, Le., shrinkage. Shrinkage

results in the generation of...32 and number 656 exceed some threshold, and may be included if it represented a **situation** that is cither highly **correlated** with healthy or highly correlated with cancerous DNA. Thus, such features are input to the...

...out-of-sample data. This process is typically executed several times on different training data **sets** , thus lo generating **several** **models** . This **set** of **models** is then **input** into thefinal stage of the tecImique, Le., shrinkage. Shrinkage results in the generation of a...

...The combination of models is particularly relevant to cancer elassification when attempting to build a **model** that differentiates between **several** cancer types. **Models** are initially constructed to distinguish between pairs of cancer classes. Shrinkage then combines these models...

Claim

... substep of scanning the input sequences to detenuine an interestingness measure of at Icast one **event** in the **input** sequences.

9 The method according to claim 8, wherein step (d) comprises the substeps of:
i. initializing a patteni list by inserting all **events** of the **input** sequences thercin, and
ii. from all pattems in the pattem hit, selecting a first pattem...

...wherein step (d) comprises the substeps of.
i. initializing a pattem list by inserting all **events** of the **input** sequences therein,
ii. inifializing at least one suffix list,
iii. calculating locations of certain pattems...

...wherein step (f) includes the substep of generating a single model based on each functional **model** of the respective **set** of the nirther records.

19 The method aceording to claim 1, further comprising the steps... substep of scanning the input sequences to deterinine an interestingness measure of at least one **event** in the **input** sequences.

35 The system according to claim 34, wherein, in step (d), the processing arrangement:
i. initializes a pattem list by inserting all **events** of the **input** sequences therein, and
ii. from all pattems in the pattem list, selects a first pattem...

...wherein, in step (d), the proccssing arrangement:
L initializes a pattem list by inserting all **events** of the **input** sequences therein,
ii. initializes at least one suffix list,
iii. calculates locations of certain pattems...

...in step (f), the processing lo arrangement generates a single model based on cach functional **model** of the respective **set** of the flirther records.

45 The system according to claim 27, wherein the processing arrangement ...

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(71) Applicant *(for all designated States except US)*: **NEW YORK UNIVERSITY** [US/US]; 70 Washington Square South, New York, NY 10012-1091 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **BERGER, Gideon** [US/US]; Apartment 4G, 50 East 89th Street, New York, NY 10128 (US). **MISHRA, Bhubaneswar** [IN/US]; 16 Dunster Road, Great Neck, NY 11021 (US).

(74) Agents: **CLARK, Richard, S.** et al.; Baker Botts LLP, 30 Rockefeller Plaza, New York, NY 10112-0228 (US).

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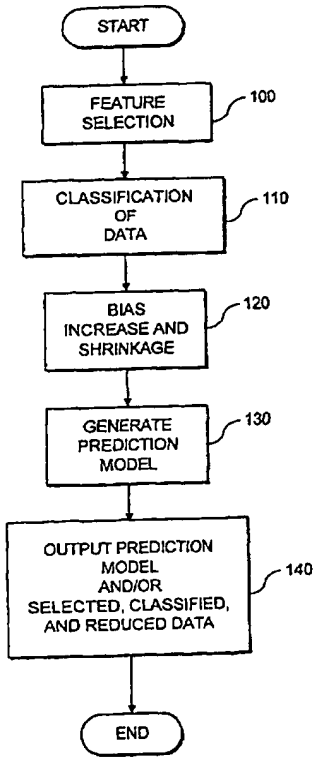
(54) Title: METHOD AND SYSTEM FOR DATA CLASSIFICATION IN THE PRESENCE OF A TEMPORAL NON-STATIONARITY



(57) Abstract: A method and system for determining a feature of a particular pattern are provided. In particular, data records are received, and predetermined patterns that are associated with at least some of the data records are obtained. Using the system and method, particular information is extracted from at least a subset of the received data records, the particular information being indicative of the particular pattern in at least some of the data records. Then, it is determined whether the particular pattern is an unexpected pattern based on the obtained predetermined patterns. In addition, it is possible to classify and reduce data and/or parameters provided in the data records. First, the data records are received. Then, the data records which have at least one particular pattern are classified using a Multivariate Adaptive Regression Splines technique. Thereafter, the data and/or parameters of the classified data records are shrunk using a Stein's Estimator Rule technique.

WO 01/88834 A2

CLAIMS

1. A method for determining a feature of a particular pattern, comprising the steps of:

a) receiving data records;

b) obtaining predetermined patterns that are associated with at least some of the data records;

c) extracting particular information from at least a subset of the received data records, the particular information being indicative of the particular pattern for at least some of the data records; and

d) determining whether the particular pattern is an unexpected pattern based on the obtained predetermined patterns.

2. The method according to claim 1, wherein at least one record of the data records includes temporal data.

3. The method according to claim 1, wherein at least one record of the data records includes non-stationary data.

4. The method according to claim 1, wherein step (b) comprises the substeps of:

i. assigning a threshold, and

ii. correlating the data records into sets of patterns as a function of the threshold.

5. The method according to claim 4, wherein step (d) includes the substep of determining if the particular pattern corresponds to at least one pattern of the sets of patterns.

6 The method according to claim 5, wherein the unexpected pattern is established if the particular pattern does not correspond to any pattern of the sets of patterns.

7. The method according to claim 1, wherein the unexpected pattern is indicative of an interestingness measure in the predetermined pattern.

8. The method according to claim 1, wherein the data records include input sequences, and wherein step (d) comprises the substep of scanning the input sequences to determine an interestingness measure of at least one event in the input sequences.

9. The method according to claim 8, wherein step (d) comprises the substeps of:

i. initializing a pattern list by inserting all events of the input sequences therein, and

ii. from all patterns in the pattern list, selecting a first pattern which has a largest interestingness measure.

10. The method according to claim 9, wherein the data records include a maximum allowable length value, and wherein step (d) comprises the substeps of:

iii. expanding the first pattern to be a second pattern,

iv. if a length of the second pattern is greater than the maximum allowable value, adding the second pattern to the pattern list, and

v. if a length of the second pattern is less than or equal to the maximum allowable value, subtracting the first pattern from the pattern list.

11. The method according to claim 10, wherein step (d) comprises the substep of repeating substeps (ii)-(v) until the pattern list becomes empty.

12. The method according to claim 11, further comprising the step of:

e) outputting the particular pattern which includes the interestingness measure.

13. The method according to claim 8, wherein step (d) comprises the substeps of:

i. initializing a pattern list by inserting all events of the input sequences therein,

ii. initializing at least one suffix list,

iii. calculating locations of certain patterns of the input sequences,

iv updating previously discovered patterns based on the calculated locations, and

v. updating the at least one suffix list using the certain patterns.

14. The method according to claim 13, wherein the data records include a maximum allowable length value, and wherein step (d) comprises the substep of:

vi. if a length of the second pattern is greater than or equal to the maximum allowable value, repeating substeps (iii)-(v).

15. The method according to claim 1, wherein step (d) includes the substep of:

i. generating further records by modifying the data records to include additional features.

16. The method according to claim 15, further comprising the step of:

(f) generating a functional model using the further records.

17. The method according to claim 16, wherein substep (i) includes generating a plurality of sets of the further records, and wherein step (f) is executed for each set of the further records.

18. The method according to claim 17, wherein step (f) includes the substep of generating a single model based on each functional model of the respective set of the further records.

19. The method according to claim 1, further comprising the steps of:

(g) after step (d), classifying the data records which have the unexpected pattern associated therewith; and

(h) generating a prediction model as a function of the classified data records.

20. The method according to claim 19, wherein step (g) is performed using a Multivariate Adaptive Regression Splines technique.

21. The method according to claim 19, further comprising the step of:

(i) shrinking at least one of data and parameters of the classified data records.

22. The method according to claim 21, wherein step (i) includes the substep of determining a mean of the at least one of the data and the parameters.

23. The method according to claim 21, wherein step (i) is performed using a Stein's Estimator Rule technique.

24. The method according to claim 1, wherein at least one of the predetermined patterns utilizes temporal modal operators.

25. The method according to claim 1, wherein at least one of the predetermined patterns utilizes logical connectives.

26. The method according to claim 1, wherein at least one of the predetermined patterns is generated by a computer program.

27. A system for determining a feature of a particular pattern, comprising:

a processing arrangement programmed to:

a) receiving data records,

b) obtaining predetermined patterns that are associated with at least some of the data records,

c) extracting particular information from at least a subset of the received data records, the particular information being indicative of the particular pattern for at least some of the data records, and

d) determining whether the particular pattern is an unexpected pattern based on the obtained predetermined patterns.

28. The system according to claim 27, wherein at least one record of the data records includes temporal data.

29. The system according to claim 27, wherein at least one record of the data records includes non-stationary data.

30. The system according to claim 27, wherein, in step (b), the processing arrangement:

i. assigns a threshold, and

ii. correlates the data records into sets of patterns as a function of the threshold.

31. The system according to claim 30, wherein, in step (d), the processing arrangement determines if the particular pattern corresponds to at least one pattern of the sets of patterns.

32 The system according to claim 31, wherein the unexpected pattern is established if the particular pattern does not correspond to any pattern of the sets of patterns.

33. The system according to claim 27, wherein the unexpected pattern is indicative of an interestingness measure in the predetermined pattern.

34. The system according to claim 27, wherein the data records include input sequences, and wherein step (d) comprises the substep of scanning the input sequences to determine an interestingness measure of at least one event in the input sequences.

35. The system according to claim 34, wherein, in step (d), the processing arrangement:

i. initializes a pattern list by inserting all events of the input sequences therein, and

ii. from all patterns in the pattern list, selects a first pattern which has a largest interestingness measure.

36. The system according to claim 35, wherein the data records include a maximum allowable length value, and wherein, in step (d), the processing arrangement:

iii. expands the first pattern to be a second pattern,

iv. if a length of the second pattern is greater than the maximum allowable value, adds the second pattern to the pattern list, and

v. if a length of the second pattern is less than or equal to the maximum allowable value, subtracts the first pattern from the pattern list.

37. The system according to claim 36, wherein, in step (d), the processing arrangement repeats substeps (ii)-(v) until the pattern list becomes empty.

38. The system according to claim 37, wherein the processing arrangement is further programmed to:

e) output the particular pattern which includes the interestingness measure.

39. The system according to claim 34, wherein, in step (d), the processing arrangement:

i. initializes a pattern list by inserting all events of the input sequences therein,

ii. initializes at least one suffix list,

iii. calculates locations of certain patterns of the input sequences,

iv updates previously discovered patterns based on the calculated locations, and

v. updates the at least one suffix list using the certain patterns.

40. The system according to claim 39, wherein the data records include a maximum allowable length value, and wherein, in step (d), the processing arrangement:

vi. repeats substeps (iii)-(v) if a length of the second pattern is greater than or equal to the maximum allowable value.

41. The system according to claim 27, wherein, in step (d), the processing arrangement:

i. generates further records by modifying the data records to include additional features.

42. The system according to claim 41, wherein the processing arrangement is further programmed to:

(f) generates a functional model using the further records.

43. The system according to claim 42, wherein, in substep (i), the processing arrangement generates a plurality of sets of the further records, and wherein the processing arrangement executes step (f) for each set of the further records.

44. The system according to claim 43, wherein, in step (f), the processing arrangement generates a single model based on each functional model of the respective set of the further records.

45. The system according to claim 27, wherein the processing arrangement is further programmed to:

(g) after step (d), classify the data records which have the unexpected pattern associated therewith, and

(h) generate a prediction model as a function of the classified data records.

46. The system according to claim 45, wherein the processing arrangement performs step (g) using a Multivariate Adaptive Regression Splines technique.

47. The system according to claim 45, wherein the processing arrangement is further programmed to:

(i) shrink at least one of data and parameters of the classified data records.

48. The system according to claim 47, wherein, in step (i), the processing arrangement determines a mean of the at least one of the data and the parameters.

49. The system according to claim 47, wherein the processing arrangement performs step (i) using a Stein's Estimator Rule technique.

50. The system according to claim 27, wherein at least one of the predetermined patterns utilizes temporal modal operators.

51. The system according to claim 27, wherein at least one of the predetermined patterns utilizes logical connectives.

52. The system according to claim 27, wherein at least one of the predetermined patterns is generated by a computer program.

53. A method for classifying and reducing at least one of data and parameters provided in the data records, comprising the steps of:

a) receiving data records;

b) classifying the data records which have at least one particular pattern, the data records being classified using a Multivariate Adaptive Regression Splines technique; and

c) shrinking the at least one of the data and the parameters of the classified data records using a Stein's Estimator Rule technique.

54. The method according to claim 53, further comprising the steps of:

d) obtaining predetermined patterns that are associated with at least some of the data records;

e) extracting particular information from at least a subset of the received data records, the particular information being indicative of the at least one particular pattern in at least some of the data records; and

f) determining whether the at least one particular pattern is an unexpected pattern based on the obtained predetermined patterns.

55. A system for classifying and reducing at least one of data and parameters provided in data records, comprising:

a processing arrangement programmed to:

a) receive the data records,

b) classify the data records which have at least one particular pattern, the data records being classified using a Multivariate Adaptive Regression Splines technique, and

c) shrink at least one of data and parameters of the classified data records using a Stein's Estimator Rule technique.

56. The system according to claim 55, wherein the processing arrangement is further programmed to:

d) obtain predetermined patterns that are associated with at least some of the data records,

e) extract particular information from at least a subset of the received data records, the particular information being indicative of the at least one particular pattern in at least some of the data records, and

f) determine whether the at least one particular pattern is an unexpected pattern based on the obtained predetermined patterns.

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METHODS OF DECOMPOSING COMPLEX DATA
TECHNIQUES DE DECOMPOSITION DE DONNEES COMPLEXES
Patent Applicant/Assignee:
FOX CHASE CANCER INSTITUTE, 7701 Burholme Avenue, Philadelphia, PA 19111, US, US (Residence), US (Nationality), (For all designated states except: US)
Patent Applicant/Inventor:
OCHS Michael F, 506 Burton Road, Oreland, PA 19075, US, US (Residence), US (Nationality), (Designated only for: US)
BROWN Truman R, 1651 Willow Grove Avenue, Laverock, PA 12938, US, US (Residence), US (Nationality), (Designated only for: US)
STOYANOVA Radka, 109 Johns Road, Cheltenham, PA 19012, US, US (Residence), BG (Nationality), (Designated only for: US)
PATRIOTIS Christos, 109 Johns Road, Cheltenham, PA 19012, US, US (Residence), CY (Nationality), (Designated only for: US)
Legal Representative:
DOYLE Kathryn (et al) (agent), Akin, Gump, Strauss, Hauer & Feld, L.L.P., One Commerce Square, 22nd floor, 2005 Market Street, Philadelphia, PA 19103-7086, US,
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Detailed Description
Claims

Detailed Description
... usual data mining procedure involves multiple steps including data selection, data cleaning, data coding, pattern **recognition** , and reporting. The **method** described in the present application patent primarily deals with the **pattern** recognition step; however, its implementation has **impact** on data cleaning and coding as well.

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Traditional **pattern recognition methods** cover a broad spectrum of **methods** , however the method presented herein is unlike all previous methods. The closest methodology presently in...learning. In essence these are not new methods. Bayesian methods use the 1 5 Bayesian

formulation of **statistics** to replace or augment the other statistical methods.

However, they do not in themselves represent...

...desire is to "teach" the computer to recognize patterns of behavior, so that when certain **events** occur the **outcome** can be predicted. The method of the present invention could be considered such "learning" since ...set of data by an original data matrix D which involves counting a number of **occurrences** of **events** within the **set** of data and encoding the number of occurrences into the original data matrix D.

In...which shows increase in mRNA levels for a series of genes during apoptosis. The top **patterns** (Fig. 17a and Fig. 17b) **simulate** gene **patterns** which are constant within the noise level during the experiment. The bottom patterns (Fig. 17c...

...are not matched between top and bottom-bottom amplitudes are actually smaller). The four basic **patterns** used to create the **simulated** dataset were (a), (b), (a+d) and (b+/-c). The second small amplitude line in each case is the deviation from the known, simulated value. The 14
distributions of these **patterns** are not shown as the **simulation** was done using random distributions.

Fig. 18 shows the correlation plot of the intensities of...

...return.

Fig. 20 is a graph showing the time behavior of each of the four **patterns** in Fig. 19. The **results** demonstrate that **pattern** I had a significant increase around 42 months into the existence of the credit card...

...to
decompose complex sets of data into manageable useful entities. Specifically, the invention includes a **statistically** based **data** mining process, wherein complex sets of data are reduced to manageable and useful entities. With...

...including, but not limited to: forecasting, such as the analysis of past and present econometric **data** to **predict** future trends; financial market analysis of stocks, bonds, derivatives, options, commodities and money; financial measurements...

...image analyses, behavior, sociological and psychological studies.

The method of the present invention is a **statistically** based **data** mining
process. It has many advantages over traditional data mining processes, especially in areas of...patterns which together can 1 5 empirically model all credit cards accounts in a bank **database** ; and, **prediction** of **outcomes** for specific **scenarios** applied to specific segments (scenario planning).

The Method and Apparatus of the Present Invention
The...econometrics. Econometrics, as used herein, includes.

(1) Forecasting -- analysis of the past and present econometric **data** to **predict**

the future;
(2) Financial markets analysis--stock, bonds, derivatives, option, commodities, money;
(3) Financial measurements...

...a set of data by an original data matrix D involves counting a number of **occurrences** of **events** within the **set** of data and encoding the number of occurrences into the original data matrix D.

Events...a set of data by an original data matrix D involves counting a number of **occurrences** of **events** within the **set** of data and encoding the number of occurrences into the original data matrix D, wherein...and Bayesian Methods" (J. Skilling and S. Sibisi, Eds.), pp. 13-24, Kluwer, Dortrecht). Bayesian **statistical analysis** starts with the apparently trivial statement,
P (My D) = p (M I D) p (D...

...the conditional probability of the model given the data (the posterior), p(D) is the **probability** of the **data** (the evidence), p(DW) is the conditional **probability** of the **data** given the model (the likelihood), and p(M) is the probability of the model (the...where only the affected components of M must be updated. Eqs. [6] and
[8] have **similar** forms for changes in the **model** for A. In order to simplify the calculations, simultaneous changes in A and F are...as expected, while the brain is internal to the muscle signal. Since the reconstructed spectra **result** from fitting the **model** to 256 data spectra, there is a dramatic improvement in the SNR
39
over the...fit the data with two basis spectral shapes to reduce the number of atoms. These **results** reflect the general **pattern** seen with this method, in which the prior becomes more and more dominant as the
41
information content in the data diminishes.

During sampling, the method also gathers **statistical data** on the distribution of the possible models, which allows it to give both the mean...

...51 x 10-5 8.4 XI O'
Table 1: the misfit to the known **input** for the highest SNR **simulation** averaged over the entire dataset is shown together with the estimates from the method for...the actual spectral shapes as well as their amplitudes, it becomes possible to interpret the **results** in terms of different physical **conditions** . From the spectral shapes and distributions, it is clear that the calf muscle contains distinct... underlying tissue which is not spatially resolved than any other method. Finally, the method avoids **biasing** the **results** in any way. The method only "knows" the number of underlying I 0 spectra to...

...since the spectra in solution space can then easily exchange flux. The calf muscle and **simulation results** show that for reconstruction of 3 strongly overlapping spectral shapes and their amplitude distributions, I ...the additional genes turned on during apoptosis was the minimal set in this case. The **results** together with the **error** are shown in Figure 17 where the intensity of the spots in Figure 16 are...company, the event which gave rise to the significant change in behavior was discovered. The **model** then used the **patterns** of response to these identified **events** to create a forward-looking behavioral model of the credit card accounts to executive and...

...could be tested as the fractional response of a given attribute to a given identified **event** became known.

By analyzing the **relationships** present in past actuals, the method of the invention identified the relationships between key points...

Claim
... a set of data
by an original data matrix D involves counting a number of **occurrences** of **events** within the **set** of data and encoding the number of occurrences into the original data matrix D.

86...Embase, Embal, Scisearch, BiotechDS, Caplus) Search Terms: Principal Component Analysis (PCA), pattern recognition, matrix decomposition, **statistical analysis** , NMR
(Nuclear Magnetic Resonance), microarray, biochip, microchip, datamining
Form PCT/ISA/210 (extra sheet) (July...

49/3,K/113 (Item 113 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00569788 **Image available**
METHODS TO REDUCE VARIANCE IN TREATMENT STUDIES USING GENOTYPING
PROCEDES VISANT A REDUIRE LA VARIANCE DES ETUDES DE TRAITEMENTS AU MOYEN DE GENOTYPAGE
Patent Applicant/Assignee:
KIVA GENETICS INC,
RIENHOFF Hugh Y Jr,
JONES Hywel B,
Inventor(s):
RIENHOFF Hugh Y Jr,
JONES Hywel B,
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Priority Application: US 98110668 19981202
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Fulltext Availability:
Detailed Description
Claims

Detailed Description
... such as clinical trials aims to eliminate the bias that can arise from "random" biological **influence** be they genetic or **environmental** , as well as **bias** introduced by the investigator wittingly or otherwise. One approach for reducing bias is to randomize...

...two groups are unrelated genetically and live independent of one another, then both genetic and **environmental influences** on the trial will be balanced in the two arms of the study. An immediate... distribution becomes leptokurtic.
Typically, the variance is due to dissimilar effects on the subjects that **influence** the biological **condition** being analyzed by statistical methods, e.g., genetic, environmental and measurement variables. For example, in...

...genetic differences between individual subjects and the environment in which the subjects live. Examples of **environmental influences** include diet, sleep **patterns** , geographical location and culture.

A "polymorphism" refers to the occurrence of two or more genetically... frequency of 0 If ac occurs more frequently, then alleles a and c are in **linkage** disequilibrium. **Linkage** disequilibrium may **result** from natural selection of certain combination of alleles or because an allele has been introduced...a random variable or test parameter is considered

statistically significant if the probability of the **result happening** by chance (the P-value) is less than some predetermined level (e.g., 0.05 ...of variance due to genetic factors and also 1.0 provide greater discriminatory power when **matching** by **environmental** factors that have an underlying genetic cause.

D. Using genes known to influence response in...
...to be statistically significant to control the rate of false positive results. If after exhaustive **analysis** , **statistical** significance is not reached for any polymorphic profile, one can conclude ...a deleterious effect on the experiment or trial, even in cases where it does not **influence** the **outcome**).

2. Genotypin - of the cohort.

Some or all of the markers are genotyped in the...

...example, giving extra weight to markers 1 5 known to be particularly informative or that **influence** the test parameter of interest.

By altering the **method** of **determining** genetic **similarity** , an experimenter can control the number of subgroups that need to be formed. For N...in genes that encode proteins that directly or indirectly influence a biochemical pathway that is **correlated** with the biological **condition** being measured or observed. Thus, for example, if a study involves assessing the efficacy of...

...significant difference, indicates that the polymorphic forms in the polymorphic profile of the treated subpopulation **correlate** with the biological **condition** (e.g., the polyrnorphic profile is correlated with a particular disease) and that the treatment method under study is useftil (or not beneficial) for treating subjects with the biological **condition** .

As noted above, such **correlations** are particularly important, for example, in clinical trials on a drug. In some instances, the...parameter between the
treatment and control subpopulations can be determined using standard methods of
23
statistical analysis . Methods include, for example, the analysis of variance, logistic regression, **cluster analysis** , non-parametric **statistics** , **contingency** table test and other standard statistical tests.

B. Repetition of Method
The polymorphic profile of...

...methods) statistical methods.

C. Treatment and Control GroWs
The members of the treatment and control **groups** all share some biological **condition** upon which the study is designed to determine whether the treatment procedure has a statistically...

...example, members of the treatment and control subpopulations can also be selected to have been **similarly** exposed to an **environmental** factor. Examples of such environmental factors include, but are not limited to, exposure to various...

...In some instances, it is useful to conduct studies using subpopulations that have not been **similarly** exposed to an **environmental** factors; such studies can be serve as a counterpoint to studies wherein the subpopulations have been selected for **similar** exposure to certain **environmental** factors. Besides environmental factors, members can also be selected to be from the same ethnic...optimize treatment studies. For example, as the genetic variance decreases, the confidence level of the **statistical analysis** increases. Thus, with the methods of the invention, researchers can more confidently attribute differences in...

...methods also enable more efficient treatment studies to be designed.

For instance, once polymorphisms that **correlate** with pathological **conditions** have been identified, subjects that have the polymorphisms as well as the biological condition can...

...when matched between patients in a control and test arms of a trial, is highly **correlative** with the biological **condition** being studied, subsequent trials of the efficacy of a treatment can be tested with fewer ...between the subpopulations. A statistically significant difference indicates that the polymorphic profile of the subpopulations **correlates** with the biological **condition** and effect of treatment. Finally, in a displaying step 106, an output of the result...

Claim

... The method of claim 1, wherein the subpopulations of subjects are selected as having been **similarly** exposed to an **environmental** factor.

20 The method of claim 1, wherein the subpopulations of subjects are selected as...

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(71) Applicant *(for all designated States except US)*: KIVA GENETICS, INC. [US/US]; 2375 Garcia Avenue, Mountain View, CA 94043 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: RIENHOFF, Hugh, Y., Jr. [US/US]; 2729 Debbie Court, San Carlos, CA 94070 (US). JONES, Hywel, B. [GB/US]; 530 Webster Street #1, Palo Alto, CA 94301 (US).

(74) Agents: AUSENHUS, Scott, L. et al.; Townsend & Townsend & Crew LLP, 8th floor, Two Embarcadero Center, San Francisco, CA 94111-3834 (US).

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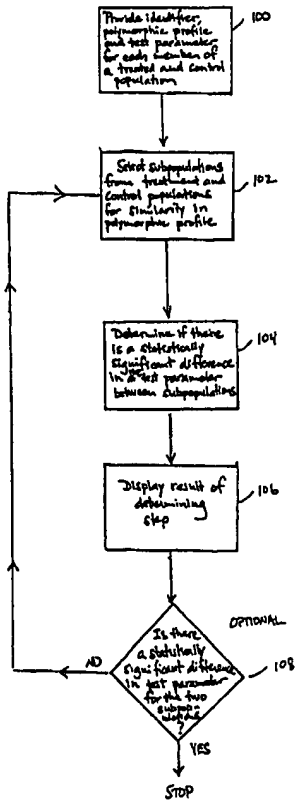
(54) Title: METHODS TO REDUCE VARIANCE IN TREATMENT STUDIES USING GENOTYPING

(57) Abstract

The present invention provides methods, computer programs and computerized systems useful for evaluating the efficacy of various types of treatment procedures (e.g., clinical trials) as a function of the genotype of a subject. By matching treatment and control groups genetically, the methods and systems of the invention reduce the total variance of the study, thereby allowing trials examining the efficacy or effect of treatment procedures to be conducted with fewer subjects, with increased confidence values, and/or with increased precision or discriminatory power. Certain methods of the invention involve selecting treated and control subpopulations of subjects from treated and control populations for similarity in polymorphic profile, wherein the treated and control populations have been treated with a treatment and control procedure, respectively. A determination is then made whether there is a statistically significant difference in a test parameter between the treated and control subpopulations as an assessment of the test procedure.



WHAT IS CLAIMED IS:

1. A method for assessing a treatment procedure, comprising:

(a) selecting treated and control subpopulations of subjects from treated and control populations of subjects, the treated population being treated with a treatment procedure and the control population being treated with a control procedure; the subjects in both the treated and control populations having been characterized for polymorphic profile, and the subjects in both the treated and control subpopulations being selected for similarity of polymorphic profile;

(b) determining whether there is a statistically significant difference in a test parameter between the treated and control subpopulations as an assessment of the treatment procedure.

2. The method of claim 1, further comprising performing a further cycle of the selecting and determining steps on a second treated and control population.

3. The method of claim 1, wherein the treated and control subpopulations are selected for similarity to a first polymorphic profile, and the second treated and control subpopulations are selected for similarity to a second polymorphic profile.

4. The method of claim 1, wherein the treatment procedure comprises administering a pharmaceutical agent to the members of the treated population.

5. The method of claim 1, wherein the treatment procedure comprises administering a pharmaceutical agent to the members of the treated population and the control procedure lacks administration of the pharmaceutical agent to the members of the control population.

6. The method of claim 1 wherein the treatment procedure comprises administering a pharmaceutical agent to the members of the treated population and the control procedure comprises administering a placebo to the members of the control population.

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00514115 **Image available**
SYSTEM AND METHOD FOR MODEL MINING COMPLEX INFORMATION TECHNOLOGY SYSTEMS
SYSTEME ET PROCEDE D'ELABORATION DE MODELES DE SYSTEMES COMPLEXES DE TECHNOLOGIE D'INFORMATION
Patent Applicant/Assignee:
PEROT SYSTEMS CORPORATION,
Inventor(s):
ADRIAANS Pieter Willem,
KNOBBE Arno Jan,
GATHIER Marc,
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Main International Patent Class: **G06F-011/34**
Fulltext Availability:
Detailed Description
Claims

English Abstract
A system and method for automatically creating causal **association models** of complex information technology (IT) systems. System components and elements are subject to periodic monitoring...

...Resulting data is accumulated and data mined for component relations within the IT system using **association** rules induction methods. **Models** of the system may then be adapted with results generated from the analysis to accurately...

Detailed Description
... general, data mining is an analysis of data in a database using tools which determine **trends** or **patterns** of **event occurrences** without knowledge of the meaning of the analyzed data. Such analysis may reveal strategic information...

...the importance of variables vary with respect to time. In situations such as these, traditional **statistical analysis** techniques or common database management systems may fail or become unduly cumbersome.

Every year, companies...employed in predicting the behavior of the components of a complex information technology (IT)

system. **Similar** approaches with appropriate modifications can be used to determine how interconnected components **influence** each other and for **uncovering** complex relations that exist throughout the IT **system** .

As discussed, multiple applications will be operated within a common IT infrastructure, such as the...unexpected relations among different components of an IT system and automatically creating or updating causal **association** **models** of such systems. This is accomplished through the use of association rule induction methods in...

...INVENTION
The present invention is directed to a system and method for automatically creating causal **association** **models** of complex information technology (IT) systems by use of association rule induction methods, preferably in...induction methods well known to those skilled in the data mining community to create causal **association** **models** of the IT system. Elements or events relating to the IT system or infrastructure 305...

...algorithm of the learning algorithms 320. The association rules algorithm 320 may confirm or refute **associations** in the existing IT system **model** , or, it may recover **associations** which are not considered in the model. The learning algorithms 320 then update an adaptive by the reference numeral by adding removing, or altering existing modeled **associations** .

The management **environment** stores all collected information and uses various learning techniques to learn about the IT system...include the number of users accessing the database, query
volume, and access time.

A final **input** to be considered is the original system **model** . The model of the IT system 305 should be developed in terms of system components...

...community. These relations are then compared to expected relations as predicted by the current system **model** given identical system state input. In this manner, causal **relationships** in the **model** can be confirmed or refuted, allowing the model to be updated to more accurately model...of such association rules algorithms. in general, the association rules algorithm verifies or refutes causal **association** rules of the **model** , where such rules have the following general form.
Monitor A (antecedent) -> Monitor B (consequent)(confidence generated.
These rules are then compared to the **association** rules in the **model** . In this way, common algorithm coding techniques can render the output process substantially automatically. Results of the comparison between the discovered set of association rules and those rules in the **model** would have two possible **outcomes** .

association rules discovered that are **coincident** with those rules in the **model** and **association** rules discovered that are not included in the model. Theref ore causal

relations not known...

...not-readable
The first two association rules output are noted to be coincident with those **association** rules of the **model** .

20
However, the last two **association** rules are not included in the model.

The system and method of the present invention may be realized in an automated fashion by having the newly discovered **association** rules automatically added to the **model** by means of appropriate coding techniques. However, such an automated means may not be desirable...

...of
association rules between components in a complex IT is system utilizing data mining and **association** rules induction methods would greatly reduce the man hours required in **detecting** **fault** causes in such a **system** .

Another obvious benefit would be the verification of a system model. System models would be...

Claim
... multiplicity of said interconnected nodes within said system; and
(d) comparing said plurality of causal **relationships** within said system with a **model** of said system, said system model substantially modeling a portion of said information technology system...

...claim 1, wherein if,
after said step of comparing, at least one of said causal **relationships** fails to **match** said **model** , adding said at least one causal **relationship** to said system **model** .
23
The method according to claim 1, wherein if,
after said step of comparing, said plurality of causal **relationships** fail to **match** said **model** , alerting a system administrator of said failure.

7 The method according to claim 1, further...

...system model is generated from the selection of a target component within said system to **model** , a **plurality** of said causal **relationships** determining a **plurality** of **model** **nodes** within said system **model** associated with said target component.

11 The method according to claim 10, wherein said target...Boolean values.

20 The method according to claim 19, wherein said plurality of Boolean values **correspond** to aplurality of performance threshold **conditions** .

21 The method according to claim 20, wherein said performance threshold conditions are predetermined.

22...

...said
interconnected nodes within said system; and
comparison means for comparing said plurality of causal **relationships** within said system with a **model** of said system, said system model substantially modeling a portion of said information technology system...

...said interconnected nodes
within said system, said comparison means compares said another plurality of causal **relationships** with said system **model** , and said modification means further modifying said system model.
26
The system according to claim 27, wherein if said comparison means fails to match at least one of said causal **relationships** with said system **model** , said modification means adds said at least one causal **relationship** to said system **model** .

30 The system according to claim 26, further comprising:
alerting means for alerting a system administrator if said plurality of causal **relationships** fail to **match** said system **model** .

31 The system according to claim 26, further comprising:
testing means for running a test...

...claim 33, wherein said
model generation means selects a target component within said system to **model** , a **plurality** of said causal **relationships** determining a **plurality** of **model** **nodes** within said system **model** associated with said target component.

35 The system according to claim 34, wherein said target...

...The system according to claim 43, wherein said
plurality of Boolean values correspond to a **plurality** of performance threshold **conditions** .

45 The system according to claim 44, wherein said performance threshold conditions are predetermined.

46...multiplicity of said interconnected nodes within said system; and
(d) comparing said plurality of causal **relationships** within said system with a **model** of said system, said system model substantially modeling a portion of said information technology system...

49/3,K/139 (Item 139 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00343164 **Image available**
METHOD AND APPARATUS FOR DETERMINING "ATTRACTORS"
PROCEDE ET APPAREIL PERMETTANT DE DETERMINER DES ATTRACTEURS
Patent Applicant/Assignee:
TARGET STRIKE INC,
Inventor(s):
OSTROVSKY Emil Y,
Patent and Priority Information (Country, Number, Date):
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International Patent Class: **G06F-17:10**
Fulltext Availability:
Detailed Description

Detailed Description
... rules
subjectively selected by an investigator based on his own experience, knowledge, and intuition.

Unfortunately, **pattern recognition** methods and "expert **system** " technology suffer from several disadvantages.

First, they are **biased** in that they produce **outcomes** that are heavily **influenced** by past **occurrences** of significant features, as in the case of pattern recognition, or by the selection criteria chosen by the investigator. As a **result** of such a **bias** , more meaningful **occurrences** of significant features within the data may be suppressed in favor of features that are...incorporates a sufficient number of cells to permit each particular transform function to produce transformed **data** that is **statistically** representative of the physical system. The "sliding window" matrix in this preferred embodiment may be...base dichotomy matrices. Figure 5 illustrates matrices Bi and B2 that are matrices from a **hypothetical set** of nk base dichotomy matrices. The shaded region represents the logical 'Ills" and the unshaded...

59/3,K/23 (Item 23 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

00971976
In situ method and system for autonomous fault detection, isolation and recovery in spacecraft
In Situ-System und Verfahren zur autonomen Fehlererkennung, -Isolierung und Korrektur in Raumfahrzeugen
Systeme **et** methode **in situ pour la** detection **, isolation et correction autonome de fautes sur des vaisseaux spatiaux**
PATENT ASSIGNEE:
TRW Inc., (376415), One Space Park, Bldg. E2/6072, Redondo Beach, California 90278, (US), (Proprietor designated states: all)
INVENTOR:
Hanson, Mark L., 519 Avenue B, No. 1, Redondo Beach, California 90277, (US)
Fesq, Lorraine M., 6738 Esplanade, Playa Del Rey, California 90293, (US)
Nguyen, Mai H., 1222 Amherst Avenue, Los Angeles, California 90025, (US)
LEGAL REPRESENTATIVE:
Schmidt, Steffen J., Dipl.-Ing. (70552), Wuesthoff & Wuesthoff, Patent- und Rechtsanwalte, Schweigerstrasse 2, 81541 Munchen, (DE)
PATENT (CC, No, Kind, Date): EP 881146 A2 981202 (Basic)
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APPLICATION (CC, No, Date): EP 98108070 980504;
PRIORITY (CC, No, Date): US 865302 970529
DESIGNATED STATES: DE; FR; GB; IT
INTERNATIONAL PATENT CLASS: B64G-001/24; G05B-009/00; **G06F-011/22**
ABSTRACT WORD COUNT: 169
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Figure number on first page: 2

LANGUAGE (Publication,Procedural,Application): English; English; English
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Available Text	Language	Update	Word Count
CLAIMS A	(English)	199849	938
CLAIMS B	(English)	200314	561
CLAIMS B	(German)	200314	512
CLAIMS B	(French)	200314	656
SPEC A	(English)	199849	5576
SPEC B	(English)	200314	5177
Total word count - document A			6515
Total word count - document B			6906
Total word count - documents A + B			13421

Systeme **et** methode **in situ pour la** detection **, isolation et correction autonome de fautes sur des vaisseaux spatiaux**
...INTERNATIONAL PATENT CLASS: **G06F-011/22**

...SPECIFICATION may not only fail to correct the fault, but may also compound or create additional **faults** . As a **result** , the ground support system attempts to generate a new command sequence to attempt to recover from the previous command sequence transmitted as well as the original **fault condition** .
Conventional ground support personnel create command sequences for a ground based system in a ground...

...command sequences are then called upon when determined to be needed to correct a detected **fault condition** as previously discussed. However, the generation of faults in the test bed, no matter how...

...highly trained, ground based personnel often have to step in to attempt to diagnose a **fault condition** and generate a command sequence in hopes of correcting the problem. And, of course, not...

...in a spacecraft having a plurality of differing components, each of which may enter a **fault condition** . The spacecraft exhibits operating characteristics that may evidence the **fault condition** of any of the **plurality** of differing components. In addition, the spacecraft comprises a fault detect and isolation module that monitors the operating characteristics of the spacecraft to attempt to autonomously detect and isolate the **fault condition** . It also comprises a **fault** recovery module which responds to at least the detection of the **fault condition** by the **fault** detect and isolation module by attempting to autonomously recover the spacecraft from the **fault condition** .

In some embodiments, the spacecraft may further comprise a safe mode module that monitors the operating characteristics of the spacecraft to attempt to detect severe **fault conditions** . Upon detecting such **conditions** , the safe mode module attempts to place the spacecraft in a safe operational state. The...

...module. In some configurations, the fault recovery module may attempt the autonomous recovery of the **fault condition** via the command processor. The **fault** recovery module may also select at least one fault recovery script to attempt the autonomous recovery of the **fault condition** .

Where the **fault** recovery module utilizes fault recovery scripts, the wireless transceiver may receive transmissions from a ground...

...transceivers. The spacecraft has a plurality of differing components, each of which may enter a **fault condition** . The spacecraft exhibits operating characteristics that may evince the **fault condition** of any of the **plurality** of differing components. This system also comprises a ground based test bed, a fault detect...

...monitors the operating characteristics of the spacecraft to attempt to autonomously detect and isolate the **fault condition** . In addition, the **fault** recovery module is also disposed on the spacecraft and responds to at least the detection of the **fault condition** by the **fault** detect and isolation module by attempting to autonomously recover the spacecraft from the **fault condition** using at least one of a plurality of fault recovery scripts.

In various embodiments, others...the fault recovery module 213 fails to identify any further alternate recovery scripts. During this **process** , all information regarding **fault identification** , isolation, recovery scripts selected and **corresponding** success or failure is relayed via the transceivers 217 and 259 to the ground support unit 255.

If the **fault** recovery module 213 fails to accommodate or correct for a fault due to a failure...

...fault recovery module 213 for execution. The latter approach is often preferable when the remote **fault** recovery script must be monitored, adapted and/or disabled in an autonomous fashion. **Similarly** , **fault**

detection and isolation **procedures** and/or associated information may be delivered to the **fault** detection and isolation module 209 from ground support to assist the remote fault recovery module...

...verified, and, thus, are unlikely to send the spacecraft operational systems 205 into a severe **fault condition** when executed.

As mentioned previously, some faults may require the fault recovery module 213 to...the system 205, often times it may prove beneficial to require review of the severe **fault conditions** by ground support before such scripts are carried out.

The safe mode override module 221...

...a single standard interface to the spacecraft 201 or its constituent parts, decreasing potential other **fault conditions** .

Therefore, for example, a **series** of verified high level commands generated in the test bed 263 (e.g., in the...

...subsystems 351, 353, 355 and 357. Such data/measurements are that needed to adequately detect **fault occurrences** related to the target subsystems 351, 353, 355 and 357. As illustrated, the target systems...

...known as constraint suspension. In particular, the module 309 comprises a generic engine and a **plurality** of software **models** imbedded in a CPU 305 of the spacecraft. Further detail regarding this model-based reasoning...

...isolation module 309 propagates the preprocessed data/measurements received from the preprocessor 361 through the **plurality** of software **models** and uses tolerance checks to determine if inconsistencies exist between the hardware units and the isolation module 309 delivers a message to the **fault** recovery module 313 **indicating system** status. Messages **indicating fault** contain an **identification** number **corresponding** to the **faulty** component isolated.

The **fault** recovery module 313 responds to messages indicating **fault** by performing two actions. First, the fault recovery module 313 accesses a predefined component failure...

...1, for example.

More particularly, within the fault detection and isolation module 401, a system **model** 411 (or **plurality** thereof) generates predicted system behavior for delivery to a comparator 413. The comparator 413 compares...

...between current predicted and actual system behavior. The problem solver module 417 responds to the **matching event** (via the module 415) to deliver the **hypothesis** to the **fault** recovery module 403. A correction module 419 therein responds to the delivery by attempting to...

...module 415 (Fig. 4) is applied to prioritize and possibly narrow the field of possible **faults** . The **results** of the first stage module 515 is delivered to a second stage fault detection and...

...performs fault detection at a subsystem level, attempting to further narrow the field of possible **faults** . The **results** of the second stage module 515 is then passed to a third stage fault detection...isolation module of Fig. 4. In particular, instead of using the comparator 415 and the **system model** module 411 (Fig. 4), a **fault detection** and isolation module 551 comprises a first, second and third stage **fault** detect modules 553-555 which **correspond** in functionality to the modules

515-517 of Fig. 5a. However, the final hypothesis generated...

...mode override module monitors such behavior. If the safe mode override module detects a severe **fault condition** , as represented by an **event** block 603, the override module places the spacecraft operational systems into a safe mode or...

...severe faults occur without having to wait for the processing complexities and delays associated with **fault** isolation. It also bounds any **result** of incorrect **hypotheses** that may cause a severe **fault** .

The use of the term modules as used herein with refers generally to hardware and...

...SPECIFICATION isolation module 309 propagates the preprocessed data/measurements received from the preprocessor 361 through the **plurality** of software **models** and uses tolerance checks to determine if inconsistencies exist between the hardware units and the...

...by cycle basis, the fault detection and isolation module 309 delivers a message to the **fault** recovery module 313 **indicating system** status. Messages **indicating fault** contain an **identification** number **corresponding** to the **faulty** component isolated.

The **fault** recovery module 313 responds to messages indicating **fault** by performing two actions. First, the fault recovery module 313 accesses a predefined component failure...1, for example.

More particularly, within the fault detection and isolation module 401, a system **model** 411 (or **plurality** thereof) generates predicted system behavior for delivery to a comparator 413. The comparator 413 compares...

...between current predicted and actual system behavior. The problem solver module 417 responds to the **matching event** (via the module 415) to deliver the **hypothesis** to the **fault** recovery module 403. A correction module 419 therein responds to the delivery by attempting to...

...module 415 (Fig. 4) is applied to prioritize and possibly narrow the field of possible **faults** . The **results** of the first stage module 515 is delivered to a second stage fault detection and...

...performs fault detection at a subsystem level, attempting to further narrow the field of possible **faults** . The **results** of the second stage module 515 is then passed to a third stage fault detection...

...isolation module of Fig. 4. In particular, instead of using the comparator 415 and the **system model** module 411 (Fig. 4), a **fault detection** and isolation module 551 comprises a first, second and third stage **fault** detect modules 553-555 which **correspond** in functionality to the modules 515-517 of Fig. 5a. However, the final hypothesis generated...

...mode override module monitors such behavior. If the safe mode override module detects a severe **fault condition** , as represented by an **event** block 603, the override module places the spacecraft operational systems into a safe mode or...severe faults occur without having to wait for the processing complexities and delays associated with **fault** isolation. It also bounds any **result** of incorrect **hypotheses** that may cause a severe **fault** .

The use of the term "modules" as used herein with refers generally to hardware and...

...CLAIMS plurality of differing components, each of the plurality of differing components operating in one of **multiple conditions** including at least one **fault condition** , the spacecraft exhibiting operating characteristics indicating when a component enters a **fault condition** , the spacecraft comprising: a **fault** detect and isolation module that monitors operating characteristics of the spacecraft, said fault detect and isolation module autonomously detecting and isolating **fault conditions** based on operating characteristics of the spacecraft; and a fault recovery module, receiving an output...

...said fault recovery module performing an autonomous recovery processes to attempt to recover from said **fault condition** .

2. The spacecraft of claim I further comprising a safe mode module monitoring the operating characteristics of the spacecraft to detect severe **fault conditions** ; and, upon detecting severe **fault conditions** , said safe mode module placing the spacecraft in a safe operational state.

3. The spacecraft...

...spacecraft of claim 4 wherein the fault recovery module performs said recovery process of the **fault condition** via the command processor.

6. The spacecraft of claim 5 wherein the fault recovery module...

...plurality of differing components, each of the plurality of differing components operating in one of **multiple conditions** including at least one **fault condition** ,

the spacecraft exhibiting operating characteristics indicating when a component enters a **fault condition** , the system comprising a ground based test bed communicatively coupled with the ground support unit...

...the operating characteristics of the spacecraft, said fault detect and isolation module detecting and isolating **fault conditions** ; and

a **fault** recovery module disposed on the spacecraft and receiving an output from the fault detect and...

...least one of a plurality of fault recovery scripts to attempt to recover from the **fault condition** .

11. The system of claim 10 wherein the ground support unit wirelessly transmits at least...

...plurality of fault recovery scripts, and/or

further comprising a safe mode module detecting severe **fault conditions** based on the operating characteristics of the spacecraft, upon detecting severe **fault conditions** , the safe mode module placing, the spacecraft in a safe operational state.

12. The system...

...is generated in response when the fault recovery module fails to autonomously recover from a **fault condition** , and/or

wherein the **fault** detection and isolation module comprises a plurality of fault isolation sub-modules that are hierarchically...

...plurality of differing components, each of the plurality of differing

components operating in one of **multiple conditions** including at least one **fault condition** , the remote unit exhibiting operating characteristics that indicate when a component enters a **fault condition** , the system comprising:

a **fault** detect and isolation module disposed on the remote unit that monitors the operating characteristics of the remote unit to autonomously detect and isolate **fault conditions** ; and

a **fault** recovery module disposed on the remote unit which responds to at least the detection of the **fault condition** by the **fault** detect and isolation module to autonomously recover the remote unit from the **fault condition** using at least one of a plurality of fault recovery scripts.

15. The system of...

...safe mode module that monitors the operating characteristics of the remote unit to detect severe **fault conditions** ; and, upon detecting severe **fault conditions** , the safe mode module placing the remote unit in a safe operational state, and/or...

...failed attempt by the fault recovery module to autonomously recover the remote unit from the **fault condition** .

17. The system of claim 16 wherein the safe mode module overrides an ongoing attempt...

59/3,K/27 (Item 27 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

00910398
Scheme for model adaptation in pattern recognition based on taylor expansion
Schema und Modelladaption bei Mustererkennung welche auf Taylorausdehnung basiert
Schema et adaptation des modeles chez la reconnaissance des dessins base sur l'expansion de Taylor
PATENT ASSIGNEE:
NIPPON TELEGRAPH AND TELEPHONE CORPORATION, (686339), 19-2 Nishi-Shinjuku 3-chome, Shinjuku-ku, Tokyo 163-19, (JP), (Proprietor designated states: all)
INVENTOR:
Yamaguchi, Yoshikazu, 3-20-2-212, Hinode-cho, Yokosuka-shi, Kanagawa-ken, (JP)
Sagayama, Shigeki, 5-5-10, Naka-cho, Hoya-shi, Tokyo, (JP)
Takahashi, Jun-ichi, 334-8, Shimomizo, Sagamihara-shi, Kanagawa-ken, (JP)
Takahashi, Satoshi, 3-20-309, Hinode-cho, Yokosuka-shi, Kanagawa-ken, (JP)
LEGAL REPRESENTATIVE:
von Fischern, Bernhard, Dipl.-Ing. et al (9674), Hoffmann - Eitle, Patent- und Rechtsanwalte, Arabellastrasse 4, 81925 Munchen, (DE)
PATENT (CC, No, Kind, Date): EP 831461 A2 980325 (Basic)
EP 831461 A3 981118
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APPLICATION (CC, No, Date): EP 97116079 970916;
PRIORITY (CC, No, Date): JP 96250540 960920
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ABSTRACT WORD COUNT: 9101
NOTE:
Figure number on first page: 1

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FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	199813	3701
CLAIMS B	(English)	200349	2391
CLAIMS B	(German)	200349	2024
CLAIMS B	(French)	200349	2842
SPEC A	(English)	199813	8182
SPEC B	(English)	200349	5647
Total word count - document A			11886
Total word count - document B			12904
Total word count - documents A + B			24790

...SPECIFICATION thereby improving the recognition performance.
Note that the present invention is generally applicable to various **pattern** recognition using the Hidden Markov **Model** (HMM), but the following description will be given for an exemplary case of speech recognition for the sake of clarity.

DESCRIPTION OF THE BACKGROUND ART
In the speech recognition, the **input** speech data is **matched** with

the acoustic **model** (phoneme **model** , syllable model, word model, etc.) obtained from training speech data and the likelihood is determined...

...from the condition at a time of actual recognition, there arises a mismatch between the **input** speech **pattern** and the **model** which in turn causes a lowering of the recognition rate.

Such a lowering of the recognition rate due to a mismatch between the **input** speech data and the acoustic **model** can be prevented by re-creating the model by using the speech data recorded under...

...this reason, there is a need for the adaptation technique that can adapt a mismatching **model** to a **model** that completely **matches** with the **condition** at a time of actual recognition, by using less amount of training data and less...

...INVENTION

It is therefore an object of the present invention to provide a scheme for **model** adaptation in the **pattern** recognition, which is capable of realizing a fast, real time model adaptation and improving the...

...initial model as a reference model, so as to adapt the initial model before the **condition** change to a **model** that **matches** with the **environmental condition** after the condition change.

According to one aspect of the present invention there is provided a method of **model** adaptation in a **pattern** recognition in which a likelihood of an **input** vector with respect to each probabilistic **model** expressing features of each recognition category is calculated and a recognition category expressed by a probabilistic model with a highest likelihood among a **plurality** of prescribed probabilistic **models** is outputted as a recognition result, the method comprising the steps of: determining a change in a parameter expressing a **condition** of **pattern** recognition and probabilistic **model** training, between an initial condition at a time of acquiring training data used in obtaining...

...to another aspect of the present invention there is provided a computer based apparatus for **model** adaptation in a **pattern** recognition in which a likelihood of an **input** vector with respect to each probabilistic **model** expressing features of each recognition category is calculated and a recognition category expressed by a probabilistic model with a highest likelihood among a **plurality** of prescribed probabilistic **models** is outputted as a recognition result, the apparatus comprising: a change determination unit for determining a change in a parameter expressing a **condition** of **pattern** recognition and probabilistic **model** training, between an initial condition at a time of acquiring training data used in obtaining...

...computer readable program code means embodied therein for causing a computer to function as a **model** adaptation system in a **pattern** recognition in which a likelihood of an **input** vector with respect to each probabilistic **model** expressing features of each recognition category is calculated and a recognition category expressed by a probabilistic model with a highest likelihood among a **plurality** of prescribed probabilistic **models** is outputted as a recognition result, the computer readable program code means including: first computer...

...code means for causing said computer to determine a change in a parameter expressing a **condition** of **pattern** recognition and probabilistic **model** training, between an initial condition at a time of

acquiring training data used in obtaining...

...unit for inputting input vectors; a parameter extraction unit for extracting a parameter expressing a **condition** of **pattern** recognition and probabilistic **model** training from each **input** vector; an initial **condition** probabilistic **model** creation and storage unit for creating and storing an initial condition probabilistic model from the parameter expressing the **condition** extracted from the **input** vector **inputted** under an initial **condition** at a time of acquiring training data; a reference probabilistic model storage unit for storing prescribed reference probabilistic **models** **corresponding** to a prescribed value of the parameter expressing the condition; an initial condition imposed probabilistic...

...probabilistic model and an adaptation target condition probabilistic model obtained from the parameter expressing the **condition** which is extracted from the **input** vector **inputted** under a current **condition** at a time of actual recognition; an adapted condition imposed probabilistic model calculation and storage...
...expressing features of each recognition category and outputting a recognition category with respect to the **input** vector expressed by an adapted **condition** imposed probabilistic model with a highest likelihood among the adapted condition imposed probabilistic models as...

...estimation and under-estimation error components of the noise data which is obtained from the **input** noisy speech data **inputted** under an initial **condition** at a time of acquiring training data; a clean speech model storage unit for storing...

...estimation and under-estimation error components of the noise data which is obtained from the **input** noisy speech data **inputted** under a current **condition** at a time of actual recognition; an adapted noisy speech model calculation and storage unit...

...from a partial or entire section of the noise data which is obtained from the **input** noisy speech data **inputted** under a current **condition** at a time of actual recognition, and subtracting the average spectrum from a spectrum of an entire section of the **input** noisy speech data **inputted** under a current **condition** at a time of actual recognition; and a speech recognition unit for carrying out a...
...of the present invention there is provided a pattern recognition method, comprising the steps of: **inputting** input vectors; extracting a parameter expressing a **condition** of **pattern** recognition and probabilistic **model** training from each **input** vector; creating and storing an initial **condition** probabilistic model from the parameter expressing the **condition** extracted from the **input** vector **inputted** under an initial **condition** at a time of acquiring training data; storing prescribed reference probabilistic **models** **corresponding** to a prescribed value of the parameter expressing the condition; creating and storing initial condition...

...probabilistic model and an adaptation target condition probabilistic model obtained from the parameter expressing the **condition** which is extracted from the **input** vector **inputted** under a current **condition** at a time of actual recognition; calculating and storing adapted condition imposed probabilistic models from...

...estimation and under-estimation error components of the noise data which is obtained from the **input** noisy speech data **inputted** under an initial **condition** at a time of acquiring training data; storing prescribed clean speech models; creating and storing...
...estimation and under-estimation error components of the noise data which is obtained from the **input** noisy speech data **inputted** under a current **condition** at a time of actual recognition; calculating and storing adapted noisy speech models from the...

...from a partial or entire section of the noise data which is obtained from the **input** noisy speech data **inputted** under a current **condition** at a time of actual recognition, and subtracting the average spectrum from a spectrum of an entire section of the **input** noisy speech data **inputted** under a current **condition** at a time of actual recognition; and carrying out a speech recognition by calculating a...

...result.

According to another aspect of the present invention there is provided a method of **model** adaptation in a **pattern** recognition in which a likelihood of an **input** vector with respect to each probabilistic **model** expressing features of each recognition category is calculated and a recognition category expressed by a probabilistic model with a highest likelihood among a **plurality** of prescribed probabilistic **models** is outputted as a recognition result, the method comprising the steps of: (a) training an intial condition probabilistic model from a parameter expressing a **condition** of **pattern** recognition and probabilistic **model** training which is recorded at a time of model training; (b) obtaining an initial condition imposed probabilistic models from the initial condition probabilistic **model** and prescribed reference probabilistic **models** **corresponding** to a prescribed value of the parameter expressing the condition; (c) calculating and storing Jacobian ...

...to another aspect of the present invention there is provided a computer based apparatus for **model** adaptation in a **pattern** recognition in which a likelihood of an **input** vector with respect to each probabilistic **model** expressing features of each recognition category is calculated and a recognition category expressed by a probabilistic model with a highest likelihood among a **plurality** of prescribed probabilistic **models** is outputted as a recognition result, the apparatus comprising: (a) a unit for training an intial condition probabilistic model from a parameter expressing a **condition** of **pattern** recognition and probabilistic **model** training which is recorded at a time of model training; (b) a unit for obtaining an initial condition imposed probabilistic models from the initial condition probabilistic **model** and prescribed reference probabilistic **models** **corresponding** to a prescribed value of the parameter expressing the condition; (c) a unit for calculating...
...computer readable program code means embodied therein for causing a computer to function as a **model** adaptation system in a **pattern** recognition in which a likelihood of an **input** vector with respect to each probabilistic **model** expressing features of each recognition category is calculated and a recognition category expressed by a probabilistic model with a highest likelihood among a **plurality** of prescribed probabilistic **models** is outputted as a recognition result, the computer readable program code means including: first a...

...causing said computer to train an intial condition probabilistic model from a parameter expressing a **condition** of **pattern** recognition and probabilistic **model** training which is recorded at a time of model training; second computer readable program code...

...said computer to obtain an initial condition imposed probabilistic models from the initial condition probabilistic **model** and prescribed reference probabilistic **models** **corresponding** to a prescribed value of the parameter expressing the condition; third computer readable program code...

...Taylor expansion between small changes of vectors contained in two domains in a non-linear **relationship** , which is utilized in the **model** adaptation scheme of the present invention

Fig. 2 is a diagram for explaining a non...

...EMBODIMENTS

Referring now to Fig. 1 to Fig. 8, various embodiments of a scheme for **model** adaptation in the **pattern** recognition according to the present invention will be described.

The model adaptation scheme of the...

...generally applicable to a type of pattern recognition processing in which a likelihood of an **input** vector with respect to each probabilistic **model** expressing features of each recognition category is calculated and a category expressed by a model...

...these two conditions in approximation using the Taylor expansion, updating a parameter of a reference **model** accordingly, creating a **model** that **matches** with the **condition** at a time of actual recognition accordingly, and carrying out the recognition by using this **matching** **model** .

First, with references to Fig. 1 and Fig. 2, the basic principle of the present...

...in the model parameter and (DELTA)x is a change in the parameter expressing the **condition** . According to the above **relationship** (4), a change (DELTA)y in the model parameter can be obtained in approximation by...

...of whether a change in the parameter expressing the condition and a change in the **model** parameter are in a linear **relationship** or in a non-linear relationship.

Note that a change in the vector is assumed...10), when CN)), CR)), JN)) and CN))' are determined, the noisy speech cepstrum CR))' that **matches** with the **condition** at a time of actual recognition can be obtained immediately.

The model adaptation scheme of...

...rate regardless of a type of the adaptation target noise.

In this third embodiment, the **model** adaptation apparatus has a configuration **similar** to that of Fig. 3 described above, except that the initial noise (HMM) memory unit...

...CLAIMS intial condition probabilistic model from a parameter expressing a condition of pattern recognition and probabilistic **model** training which is recorded at a time of model training;

(b) a unit for obtaining an initial condition imposed probabilistic

models from the initial condition probabilistic **model** and prescribed reference probabilistic **models** **corresponding** to a prescribed value of the parameter expressing the condition;

(c) a unit for calculating...

...computer readable program code means embodied therein for causing a computer to function as a **model** adaptation system in a **pattern** recognition in which a likelihood of an **input** vector with respect to each probabilistic **model** expressing features of each recognition category is calculated and a recognition category expressed by a probabilistic model with a highest likelihood among a **plurality** of prescribed probabilistic **models** is outputted as a recognition result, the computer readable program code means including:

first a...

...causing said computer to train an intial condition probabilistic model from a parameter expressing a **condition** of **pattern** recognition and probabilistic **model** training which is recorded at a time of model training;

second computer readable program code...

...said computer to obtain an initial condition imposed probabilistic models from the initial condition probabilistic **model** and prescribed reference probabilistic **models** **corresponding** to a prescribed value of the parameter expressing the condition;

third computer readable program code...

59/3,K/34 (Item 34 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS

00845192
METHOD **AND** SYSTEM **FOR PATTERN** RECOGNITION **BASED ON DYNAMICALLY CONSTRUCTING A SUBSET OF REFERENCE VECTORS**
VERFAHREN UND SYSTEM ZUR MUSTERERKENNUNG MITTELS DYNAMISCHER ERZEUGUNG EINER UNTERMENGE VON REFERENZVEKTOREN
PROCEDE ET SYSTEME DE RECONNAISSANCE DE MOTIFS BASES SUR LA CONSTRUCTION DYNAMIQUE D'UN SOUS-ENSEMBLE DE VECTEURS DE REFERENCE
PATENT ASSIGNEE:
Koninklijke Philips Electronics N.V., (1489041), Groenewoudseweg 1, 5621 BA Eindhoven, NL\(Proprietor designated states: , FR; GB)
Philips Corporate Intellectual Property GmbH, (202270), Habsburgerallee 11, 52064 Aachen, DE\(Proprietor designated states: , DE)
INVENTOR:
BEYERLEIN, Peter, Ellendorferstrasse 87, D-52078 Aachen, (DE)
ULLRICH, Meinhard, Dieter, Kaiserseschерstrasse 1, D-50935 Koln, (DE)
LEGAL REPRESENTATIVE:
Groenendaal, Antonius Wilhelmus Maria et al (59381), INTERNATIONAAL OCTROOIBUREAU B.V., Prof. Holstlaan 6, 5656 AA Eindhoven, (NL)
PATENT (CC, No, Kind, Date): EP 788648 A2 970813 (Basic)
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WO 9708685 970306
APPLICATION (CC, No, Date): EP 96926536 960826; WO 96IB849 960826
PRIORITY (CC, No, Date): NL 9520231 950828
DESIGNATED STATES: DE; FR; GB
INTERNATIONAL PATENT CLASS: G10L-015/10
NOTE:
No A-document published by EPO
LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS B	(English)	200033	1601
CLAIMS B	(German)	200033	1552
CLAIMS B	(French)	200033	1910
SPEC B	(English)	200033	8503
Total word count - document A			0
Total word count - document B			13566
Total word count - documents A + B			13566

METHOD **AND** SYSTEM **FOR PATTERN** RECOGNITION **BASED ON DYNAMICALLY CONSTRUCTING A SUBSET OF REFERENCE VECTORS**

...SPECIFICATION unit could, for instance be, five or six. In which case a state, in average, **corresponds** to an observation interval. The **model** of figure 2 allows a state to stay the same, which can be associated with ...

...Markov process is the set of states at each instance of time, where each state **corresponds** to an observable **event** . For speech recognition systems, the concept of discrete Markov processes is extended to the case ...is also based on the observation vector. It is a further object to provide a **method** and **system** which gives the potential to **recognise patterns** with a lower **pattern error** rate. It is a further object to provide a method and system which gives the...mu)a)). All reference

vectors together form a set ((mu)a))) of reference vectors. Using **pattern** recognition based on Hidden Markov **Models** , each reference **pattern** is modelled by a Hidden Markov Model, where the states of the **model** **correspond** to a reference unit. Using continuous observation densities, such as Gaussian or Laplacian densities, the...

...shown in the formula. Speech recognition systems usually use Laplacian or Gaussian probability densities to **model** the probability distribution of a **cluster** . Using the Lr))-norm, defined as: where the L1))-norm is used for Laplacian densities and the L2))-norm is used for Gaussian densities, gives as one of the possible **formulas** for the **probability** : where the reference vector (mu)(k) is the mean vector of the k-th observation...this key element can be used in combination with other techniques, such as Hidden Markov **Models** , to recognise a time-sequential **pattern** , which is derived from a continual physical quantity. Using such techniques, for each observation vector...

59/3,K/125 (Item 33 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00489665 **Image available**
SYSTEMS AND METHODS **FOR ADAPTIVE PROFILING, FAULT** DETECTION **, AND ALERT GENERATION IN A CHANGING ENVIRONMENT WHICH IS MEASURABLE BY AT LEAST TWO DIFFERENT MEASURES OF STATE**
SYSTEMES **ET PROCEDES POUR ETABLISSEMENT DE PROFIL ADAPTATIF,** DETECTION **DE DEFAILLANCES ET FOURNITURE D'ALARMES DANS UN ENVIRONNEMENT EVOLUTIF MESURABLE PAR AU MOINS DEUX MESURES D'ETAT DIFFERENTES**
Patent Applicant/Assignee:
INTELLINET INC,
Inventor(s):
BAKER Michelle,
RYAN Thomas A,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9921017 A1 19990429
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Priority Application: US 97956227 19971022
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AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZW GH GM KE LS MW SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
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SYSTEMS AND METHODS **FOR ADAPTIVE PROFILING, FAULT** DETECTION **, AND ALERT GENERATION IN A CHANGING ENVIRONMENT WHICH IS MEASURABLE BY AT LEAST TWO DIFFERENT...**
SYSTEMES **ET PROCEDES POUR ETABLISSEMENT DE PROFIL ADAPTATIF,** DETECTION **DE DEFAILLANCES ET FOURNITURE D'ALARMES DANS UN ENVIRONNEMENT EVOLUTIF MESURABLE PAR AU MOINS DEUX...**
...International Patent Class: **G06F-019/00**
Fulltext Availability:
Detailed Description

English Abstract
Systems and methods for detecting changes, and in particular **faults** , in a changing **environment** (12) include constructing a profile is made of the **environment** using observations made during no **fault condition** (14). A range of values (14) for one or more "trusted" variables (14) are identified as values indicative of a no **fault condition** . Data is also collected (only at times when the trusted variable(s) indicate(s) no fault) for other variables which may be indicative of a **fault condition** . Statistical profiles (19) are established for each of these other variables. The environment is continuously...

...normal conditions, as indicated by the trusted variable(s). When, during the monitoring of the **environment** , data for any of the **fault** detection variables, which may or may not include the trusted variable, exhibit values outside of...

Detailed Description
... OF THE INVENTION

1. Field of the Invention

The invention relates to fault detection and **fault** identification in a complex **environment** . More particularly, the invention relates to ... for profiling "normal conditions" in a complex environment, for automatically updating the profiles of "normal **conditions** ", for automatically detecting **faults** based on the "normal **conditions** " profiles, and for identifying **faults** in **environments** which are measurable by **multiple** variables

2. State of the Art

Automated alert generation based on profiles of normal behavior...

...data collected represents the state of the environment at different times whether or not a **fault condition** exists. It ...value of the data sets will be a fair indicator of the state of the **environment** when no **faults** are present

New observations of the environment may then be compared to the profile to occur when the environment is operating under high volume **conditions** and data **collection** for generating a profile of normal conditions is best accomplished during low volume conditions

A commonly known volume processing **environment** in which **fault** detection is critical is a telecommunications network such as the internet. Faults in the internet...a problem, fault detection methods seek only to determine whether or not a problem exists. Fault **detection methods** do not necessarily **result** in a specific **identification** of the cause of the problem. Research on alert **correlation** is a form of **fault** diagnosis in which an attempt is made to group a multiplicity of incoming alerts according...

...this problem by both industry and academics. ,SM, , J.F Jordan and M.E. Paterok, **Event Correlation** in Heterogeneous Networks Usin - the OSI Management Framework, Proceedings of the TISINM International Symposium on...that of the multivariate measures and found that the humans performed better in detecting obvious **fault situations** whereas the measures were better in detecting non-obvious faults. He also compared the performance...known, however, that the present methods of defining a profile of normal behavior have not **resulted** in accurate **fault** detection, particularly in communications networks. In addition, little progress has ...of normal conditions in a environment, it is important to collect data only when no **fault conditions** exist; that there is a characteristic **relationship** between a measure of normal **conditions** and a measure of **fault conditions** ; and that in volume processing **environments** , **faults** are more likely to be present when the environment is operating at low volume. The are based on averaging techniques that combine observations from **situations** in which there are **faults** with those from **situations** in which the environment is trouble free. Detection methods based on profiles built in this...

...has been discovered that a profile is much more accurate if data collected during a **fault condition** is eliminated from the population of data used to create the profile. Moreover, contrary to...faults, it has been discovered that high volume is a

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symptom of a no **fault condition** . Therefore, in accord with the invention, profiles are built from data which is taken only...

...other than volume environments, only during conditions which are proven to be indicative of no
fault)
According to a generalized **model** of the systems and methods of the invention, a profile is made of the **environment** using observations made during no **fault conditions** . A range of values for one or more "trusted" variables are identified as values indicative of a no **fault condition** . Data is also collected (only at times when the trusted variable(s) indicate(s) no fault) for other variables which may be indicative of a **fault condition** . Statistical profiles are established for each of these other variables. In a simple implementation, profiles ...the environment, the trusted variable(s) exhibit value(s) outside the normal range, a possible **fault condition** is indicated and the present values of the other variables are examined to determine whether...may include a number of variables which are combined in different ways depending on the **environment** and the **fault** thresholds likewise may be each built from a number of related variables which are indicative...

...is monitored for deviation from normal, the normal profile is preferably adaptively updated during normal **conditions** , and
6
the **fault** thresholds are ...profile generation. It acts to remove inaccuracies which result from mixing sample points from both **fault** -free and **faulty conditions** and treating them identically when constructing a statistical profile of normal behavior for a measure...adaptive profiling;
Figure 4 is a schematic diagram of the relationship between trusted variables and **fault**
variables and how **environment** profiles are updated;
Figure 5 is a schematic representation of the statistical variance of trusted...model of the systems and methods of the invention, a profile is made of the **environment** using observations made during no **fault conditions** . A range of values for one or more "trusted" variables are identified as values indicative of a no **fault condition** . In other words, whenever the trusted variable is above a ...a range, for example, it is most likely or perhaps assured that there is no **fault** in the **environment** . It must be noted, however, that the converse proposition, "whenever the trusted variable is below the threshold or outside the range, there is a **fault** in the **environment** " is not necessarily true and is usually not true. Thus, the trusted variable is a...

...indicating the presence of a fault. One may view the trusted variable as indicating a **condition** precedent for a **fault** , since so long as the trusted variable is above threshold or within range, there is no
fault condition

According to the generalized **model** of the invention, observations in the form of measurable data are collected only at times...

...of the trusted variable and the bounds observed for other variables during times of no- **fault conditions** as indicated by the trusted variable. In most cases, the trusted variable will be chosen...built in this way, the fault detection process can begin an iterative examination

of the **environment** . A simplified **model** of the **fault** detection process is
shown in Figure 1

Turning now to Figure 1, the fault detection...time. If it is determined at 12 that the trusted variable no longer indicates a **fault** -free **environment** , another variable (measure of the environment) is examined at 14 to determine whether its value is within the range **set** forth in the no- **fault** **environment** profile. If it is determined at 14 that the "fault variable" is within normal limits...adds an extra step to fault detection. It will be understood, however, that in a **environment** having a profile with many **fault** variables, the examination of the trusted variable in the fault detection process will actually make...1. If it is determined at 12 that the trusted variable no longer indicates a **fault** -free **environment** , **multiple** **fault** variables are examined at 14a, 14b, 14c, etc. to determine whether their values are within the ranges **set** forth in the no- **fault** **environment** profile. If it is determined at any one of 14a, 14b, 14c, etc. that a...variables). Thus, as shown in Figure 3, each time the trusted variable indicates a no **fault** state of the **environment** at 12, the profiles of the fault detection variables ...indicate the same steps in the system. Figure 4 shows another way of representing the **system** shown in Figure 3 and which **indicates** the **relationship** between the trusted variable(s) and the **fault** detection variables. The profiles 19 shown in Figure 4 are updated at 18 each time the trusted variable(s) are within the range 20 indicative of no **fault** in the **environment** . When sampling of ...region of the observational pair (target variable, trusted variable) indicates a state in which no **faults** are present in the **environment** . In other domains, such a region may indicate a specific state of the environment under...systems and methods of the present invention can be applied in a number of different **environments** for **fault** detection and **fault** identification. In addition, the adaptive profiling aspects of the invention can also be applied in ...and that the specification be read likewise. Thus, while particular application of the invention to **several** **environments** have been disclosed, it will be appreciated that the systems and methods described herein may...

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SYSTEM **AND** METHOD **FOR** DETERMINING **THE IMPACT OF WEATHER AND OTHER FACTORS ON MANAGERIAL PLANNING APPLICATIONS**
SYSTEME **ET PROCEDE PERMETTANT DE** DETERMINER **L'INCIDENCE DE LA METEOROLOGIE ET D'AUTRES FACTEURS SUR DES APPLICATIONS DE PLANIFICATION DE GESTION**
Patent Applicant/Assignee:
STRATEGIC WEATHER SERVICES,
Inventor(s):
FOX Frederick D,
PEARSON Douglas R,
RHOADS Michael A,
ZALESKI Peter A,
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SYSTEM **AND** METHOD **FOR** DETERMINING **THE IMPACT OF WEATHER AND OTHER FACTORS ON MANAGERIAL PLANNING APPLICATIONS**
SYSTEME **ET PROCEDE PERMETTANT DE** DETERMINER **L'INCIDENCE DE LA METEOROLOGIE ET D'AUTRES FACTEURS SUR DES APPLICATIONS DE PLANIFICATION DE...**
Main International Patent Class: **G06F-017/60**
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Detailed Description
Claims

English Abstract
A computer-based Executive Information **System** (202) for determining the **impact** of weather and other external and internal factors on the retail industry. Utilizing a multiple regression **correlation** technique in a predictive **model** , a **correlation** of weather variables with store information for specific locations and times is performed to quantify a weather **impact model** in terms of unit or dollar sales volume change, or any other commercially useful benchmark...

...revised plan can be "weatherized" by the system by applying forecasted weather to the weather **impact model** to generate a weather-modified managerial plan (204). ...

French Abstract
...d'autres facteurs internes ou externes sur le commerce de detail. En utilisant dans un **modele** previsionnel une technique de **correlation** a regressions multiples, on obtient une correlation des variables meterologiques avec des informations d'entreposage...

Detailed Description

... Climatology
synthesizes weather elements (temperature, precipitation, wind, etc.) over a long period of time (years), **resulting** in characteristic weather **patterns** for a given area for a given time frame (weekly, monthly, seasonably, etc.). This approach...

...labor scheduling, (5) reliability beyond a 3 to 5 day leadtime, (6) a predictive weather **impact model**, which links quantitative weather **impact** measurement through historical correlation, with quantitative forecasts, (7) the ability to remove historical weather effects... specificity (for example, daily and weekly time increments).

The present invention utilizes a multiple regression **correlation** technique to generate a weather **impact model** which **correlates** weather and other variables with store information for specific **locations**. The weather **impact model** quantifies the weather **impact** in terms of unit or dollar sales volume or any other commercially useful benchmark.

After determining the **relationship** between historical weather and historical sales, LEWIS generates a normalized or deweatherized historical sales baseline...

...applies them to a
forecasted weather to generate a weather-modified managerial plan.

A weather **impact model** for buying, distribution, financial budgeting, labor scheduling, advertising, promotion, and store traffic analysis applications, is...

...and reports for rapid assimilation by the user.

For advertising and promotional applications, the weather **impact model**

is used in conjunction with store information and forecasted weather data. The
output identifies how...and promotion, (5) reliability beyond a 3 to 5 day leadtime, (6) a predictive weather **impact model**, which links quantitative weather **impact** measurement through historical correlation, with quantitative forecasts, (7) the ability to remove historical weather effects...produces the
deweatherized data 205 based upon substituting normal weather data 716 into
the weather **impact model** 720. The deweatherized data 205 is used as a baseline input to the managerial plan...

...data 205.

The forecasting processor 706 applies the forecasted weather data 715 to the weather **impact model** 720 in conjunction with the revised plan 207 or in conjunction with the deweatherized data...

...based upon substitution of
forecasted weather information 715 and external information 136 into the weather **impact model** 720. The forecasting processor 706 quantitatively

modifies a forecast from a managerial plan 130, or...regression structure file. The deweatherization regression structure file defines how LEWIS will build the weather **impact model** via **multiple** regression techniques. The deweatherization regression structure file is comprised of four sections: (1) regress columns...

...3) normal variables which indicate how the variable data base normal values map into weather **impact model** 720; (4) variable mappings which indicates what the output of the weather **impact model** will be named. Each of these are discussed below.

The first section of the deweatherization regression structure file, regress columns, is the sampling of specific historical periods. Building weather **impact model** 720 requires that **associations** be made between similar historical observations of weather and sales and other external data. In...

...file, regress variables, contains the mappings of historical values from variable databases 718 into weather **impact model** 720. To perform this mapping function, the historical values to be used by weather **impact model** 720 are identified, including the transformations of those variables. These variables are present in sales...

...data storage and retrieval facility 120.
In the preferred embodiment of the present invention, weather **impact model** 720 contains nine independent variables (discussed below). The first independent variable, xTEMP, is shown below...deweatherized data results for each (product x location) combination that was run through the weather **impact model** 720.

IV. **Correlation** Processor
Figure 9 is a flowchart illustrating the steps performed by correlation processor 704. Referring to Figure 9, in step 902 correlation processor 704 generates the weather **impact model** based upon the deweatherization regression structure file defined in step 808. The weather **impact model** utilizes a **multiple** regression technique which is well known to one of ordinary skill in the art.

The weather **impact model** 720 is a **multiple** regression **model** with "V variables. This model is based on the assumption that there is a correlation...

...these relationships, and to turn them into a usable equation, referred to as the weather **impact model** . The deweatherization regression **model** also considers other variables which are not strictly weather-based to more accurately define the...

...Xk independent variables-; changes in weather,
external and internal factors
B, ... Bk regression coefficients
Weather **impact** **model** 720 is essentially this equation with the values of the coefficients determined, since these coefficients...

...B, in the
equation above). There are also N observations. We can summarize the regression **model** by writing a **series** of equations, as follows.

YI = 01+P2X21+P3X31+P4X41+ +PkXkl+el
Y2 = 01+P2X23+P3X32+P4X42+ + Pd[k2 + F2
+ I.. + I 1. -@ ... + ... ++ ...

YN Pl+P2X2N+P3X3N+P4X4N+ + PAN + EN
The **corresponding** matrix formulation of the **model** is.
y XP + C.

in which
Y, 1 X21 ... Xk1 PI el
y= Y2 X...each
independent variable as a measure of the significance of that variable to the
weather **impact** **model** 720. Values of the T statistics above about 1.5 are
preferred. the T statistics that there is at least one explanatory variable in the weather **impact** **model** 720.

In the preferred embodiment, the P-value used is an approximation rather than
a...

...Calculators Using Small Integer Coefficients," Mathematics of Computation 31:214-222 (1977).

Once the weather **impact** **model** 720 has been **determined** , the **correlation** **processor** 704 then uses the **resulting** weather **impact** **model** 720 to
forecast different values in step 906. The normal weather data 716 is substituted into weather **impact** **model** 720 for the historical weather data 714 to arrive at deweatherization data 205. Thus, the weather **impact** **model** 720 has to be generated before the deweatherized data 205 can be generated. This is referred to as the deweatherization data 205. Correlation processor 704 then outputs both, weather **impact** **model** 720 and deweatherization data 205.

V. Forecasting Processor
Figure 10 is a flowchart of the...

...processor 706. Referring to Figure 10, forecasting processor 706 receives revised managerial plan 207, weather **impact** **model** 720, and deweatherization
data 205. Weather **impact** **model** 720 and deweatherization data 205 are generated by correlation processor 704. The revised managerial plan...

...available from Strategic Weather Services, Wayne, Pennsylvania, U.S.A. to substitute into the weather- **impact** **model** 720 in addition to

existing deweatherized data 205 and other external information 136.

The forecasting...

Claim
... and said external information to
produce variable databases;
correlation processor means for generating a weather **impact model** ,
said weather **impact model** expressing a **correlation** between said
store
information and said external information contained within said variable
databases with said...

...and for substituting said normal weather data for said historical
weather data in said weather **impact model** to
generate deweatherized data; and
forecasting processor means for substituting said forecasted weather
data for said normal weather data in said weather **impact model** to
produce a weather-modified managerial plan.

2 The system of claim 1; wherein said...

...system of claim 2, wherein said substitution of said
forecasted weather data in said weather **impact model** for said normal
weather data is performed in conjunction with said revised managerial
plan.

4...system of claim 1, wherein said substitution of said
forecasted weather data in said weather **impact model** for said normal
weather data is performed in conjunction with said managerial plan.

23 The system of claim 1, wherein said substitution of said
forecasted weather data in said weather **impact model** for said normal
weather data is performed in conjunction with said deweatherization data.

24 The...to perform a least squares multiple regression on said variable
databases to produce said weather **impact model** .

34 The system of claim 33, wherein said weather **impact model**
expresses a **correlation** between said store transaction data contained
in said variable databases and said historical weather data...

...further wherein said database initializer creates retailer hierarchial
structure tables, said retailer
hierarchial structural tables **indicating** retailer-specified
parent-child
relationships ;
correlation processor means for generating a weather **impact model** ,
said weather **impact model** expressing a **correlation** between said
store
information and said external information contained within said variable
databases with said...

...and for substituting said normal weather data for said historical
weather data in said weather **impact model** to
generate deweatherized data; and
forecasting processor means for substituting said forecasted weather

data for said normal weather data in said weather **impact model** to produce a weather-modified managerial plan.